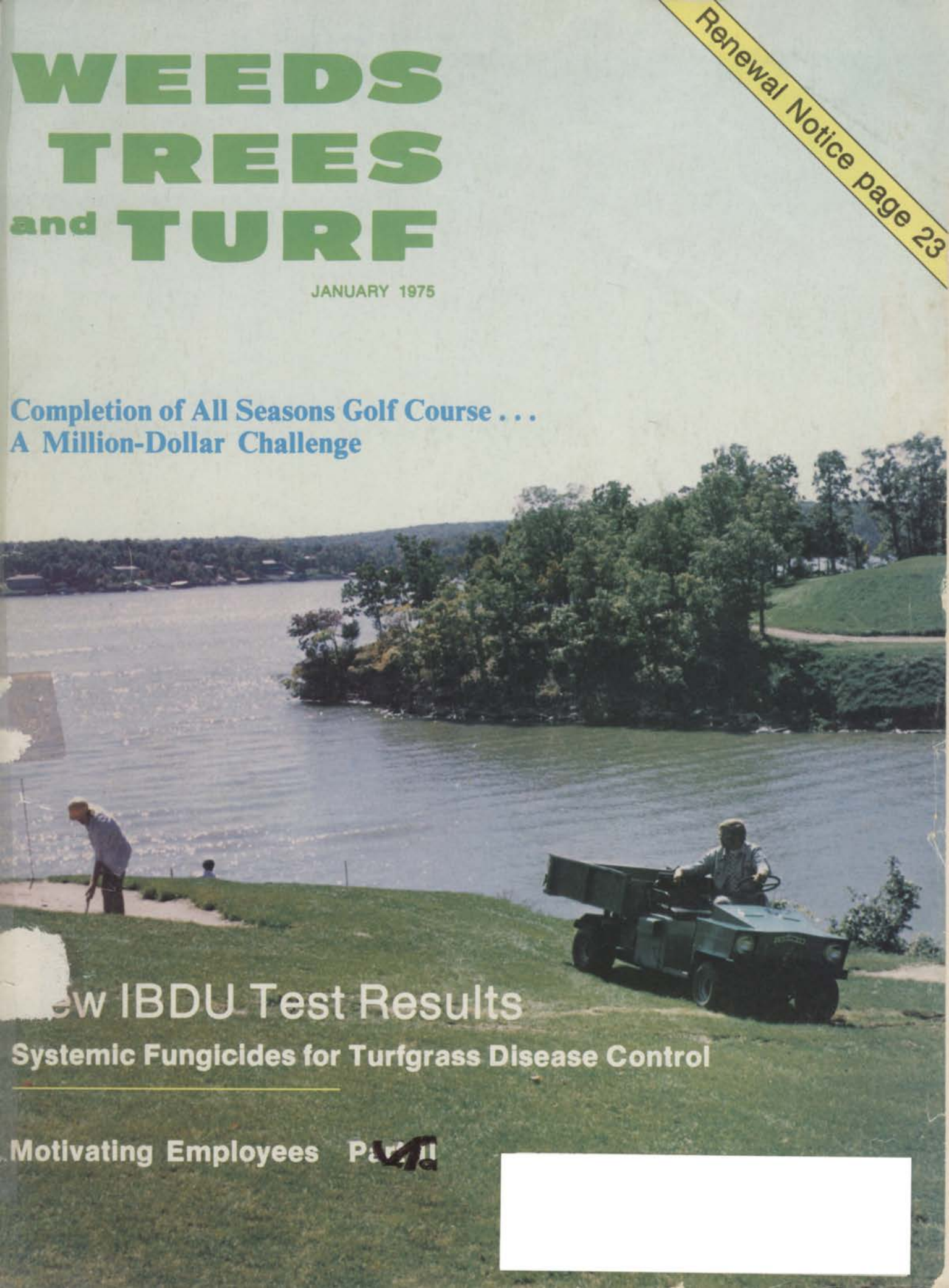
WEEDS TREES and TURF

JANUARY 1975

Renewal Notice page 23

Completion of All Seasons Golf Course . . .
A Million-Dollar Challenge

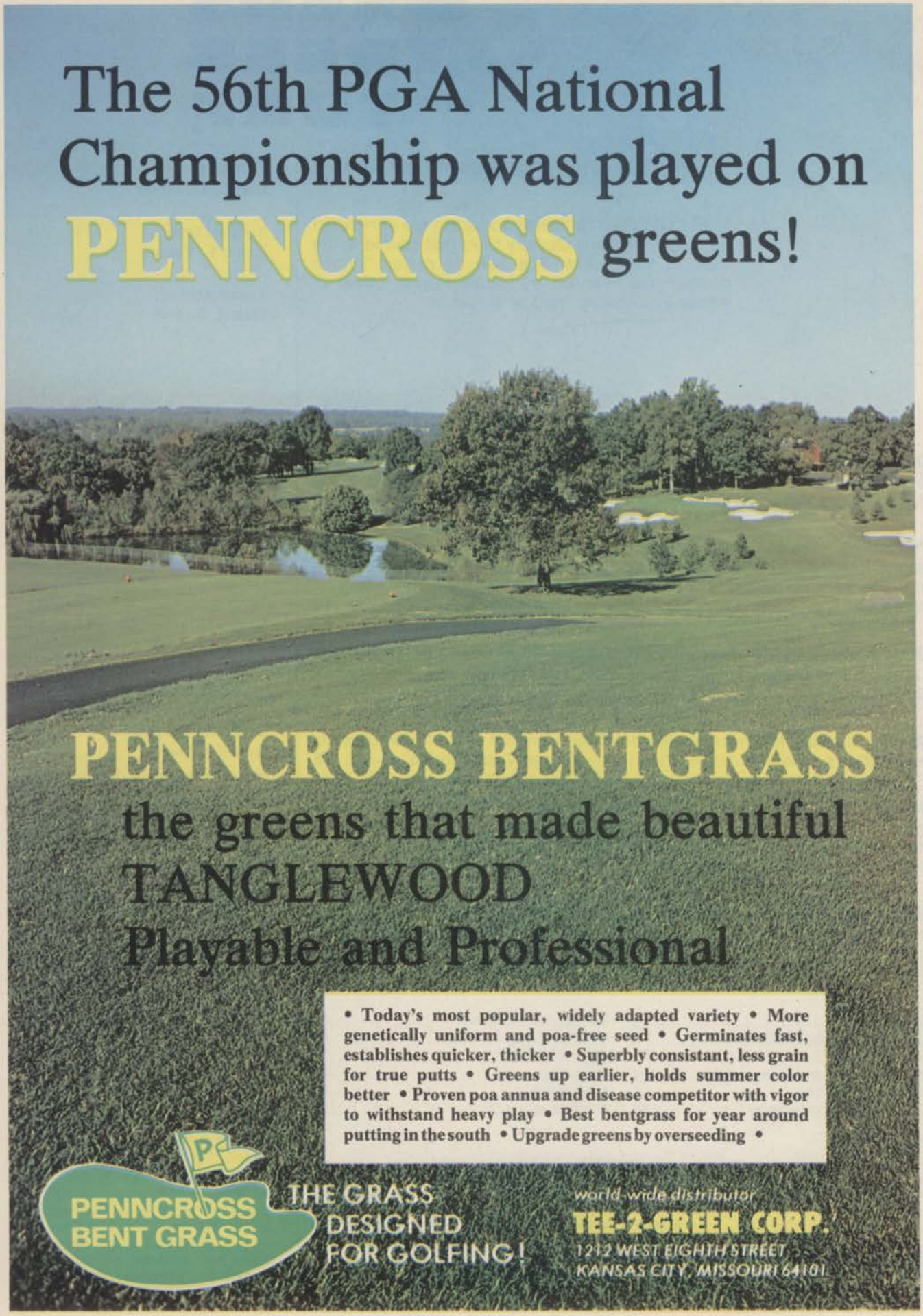


ew IBDU Test Results

Systemic Fungicides for Turfgrass Disease Control

Motivating Employees Part II

For More Details Circle (118) on Reply Card



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WEEDS TREES and TURF®

January 1975, Vol. 14, No. 1

THE COVER—The finishing touches are completed on the All Seasons Country Club golf course at the Lake of the Ozarks. The new $1 million "dream course" was financed by Harold Koplar, owner of Koplar Enterprises, Inc., of St. Louis.

One Million-Dollar Challenge—Carving a 71-par golf course from solid rock is an economic challenge as well as a physical one. But four years and one million dollars later, a Robert Trent Jones dream course becomes a reality **10**

Protection from the Unpredictable—Drying winter winds and ocean salt sprays take their toll amoung landscape plantings. Antidesiccants, which have primarily been considered transplant protection chemicals, are now being incorporated into a four-season customer spraying service **12**

Slow Release IBDU—Promising New Tests—Turf Specialist, Dr. William Daniel, relates seven years of research data on Swift's new slow releasing fertilizer **14**

Quarter Century for Irrigation Association—A report on Sprinkler Irrigation Association's 25th annual meeting in Lake Buena Vista, Florida **18**

Systemic Fungicides—their role in turf disease control—How do systemics control diseases? When is the best time to apply? The somewhat vague field of systemic fungicides is explored in depth by Richard W. Smiley **30**

Motivating the Turned-Off Employee—part two of a series of employee management articles. Dr. John L. McKeever continues his discussion of the basic needs of man and introduces goal achievement as a means of satisfying these needs **44**

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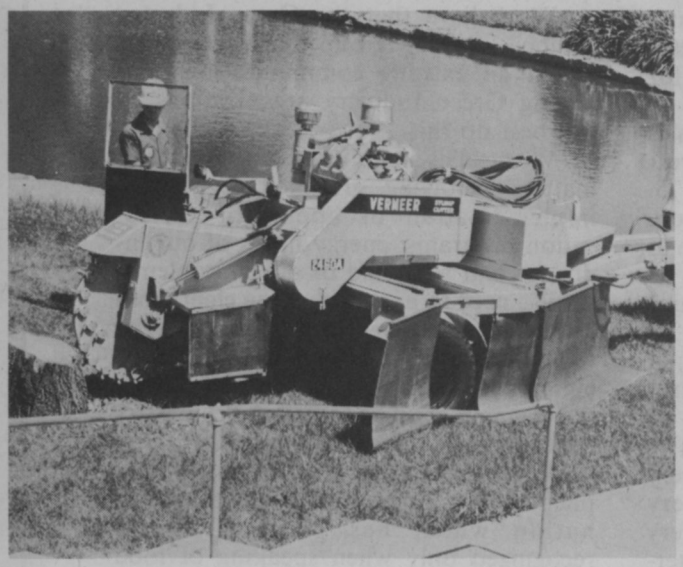
chew out stumps without eating up budgets with Vermeer Stump Cutters



Reduce the cost of labor on your stump removal projects and you minimize the single, most expensive item in your budget. That's why "The Diggin' Dutchman" built a complete line of labor-saving Vermeer Stump Cutters. With just a single operator and one Vermeer Stump Cutter, you can chew large stumps to chips in minutes. Its big hydraulically-controlled cutting wheel handles the entire job . . . much faster, easier and more economically than a whole crew. You save thousands of dollars annually, because a Vermeer Stump Cutter runs on a tankful of gas, not a handful of costly paychecks.

"The Diggin' Dutchman" has a machine to fit your operation . . . and your budget. Write, or better yet, call him today (515/628-3141) for a free demonstration.

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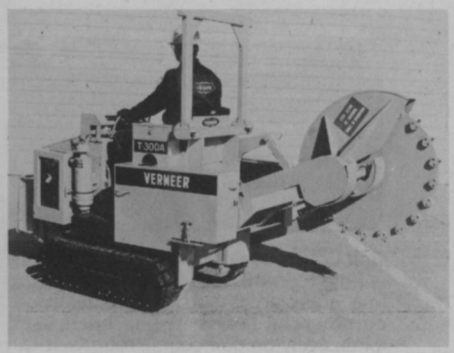
THE DIGGIN' DUTCHMAN

VERMEER TREE EQUIPMENT DIVISION

7201 NEW SHARON ROAD • PELLA, IOWA 50219



A great preventative maintenance machine! Vermeer T-300A with Root Cutter severs tree roots down to 18 in. deep to prevent sidewalk/roadway buckling.

Here's instant log disposal. Vermeer 671 Log Chipper takes lumber, railroad ties, telephone poles and chews 'em to chips in minutes. All hydraulically operated.

Vermeer Log Splitter . . . dependable, portable, hydraulically-operated unit splits logs up to 30 in. high in seconds. Great for parks, tree firms and firewood companies.

For More Details Circle (106) on Reply Card

editorial

'75 may be the year we mature as an industry. We have problems which — once solved — will be convincing proof we've been tried by fire.

We have the energy problem — contributing to inflation. Summed up, this means we will face the same critical parts shortage for equipment we faced early last year. We will pay more for parts and for all inputs.

Yet, despite this situation business is good. Most suppliers and manufacturers we deal with are projecting a good '75. These projections when backed by more care directed toward efficiency promise to hold up.

Quite frankly, we believe the major problems during '75 will continue to be the battle of communications — a fight which pervades the political and governmental areas affecting the industry.

When we speak of communications — we have to consider the need to get every entity within our industry — every national and state organization, every regional group, every commercial enterprise — to speak as one to those who, for example, criticize the use of chemical fertilizers for green areas without considering the fact that much of the Green Industry technical compound tonnage is not economically feasible for agricultural production of food products. We have to continue the fight for labels to fill the specific needs of the business.

We believe that the Green Industry Council — a new group which seeks only to fill an existing communications gap among Green Industry organizations — can best do this.

We need as an industry to give voice to matters involving greenbelt legislation, implementation of applicator certification programs, energy needs of our industry, and a myriad of other problems.

We need to back with some clout those people in government and those in legislative bodies who understand the contribution our industry makes to society and to the common good — including the massive number of jobs this green industry provides.

We are a little agriculture phenomenon; an economic bulwark to the nation which has previously been recognized only when speaking of food and fiber production.

We firmly believe that '75 can be our year both politically and economically.

UNIROYAL

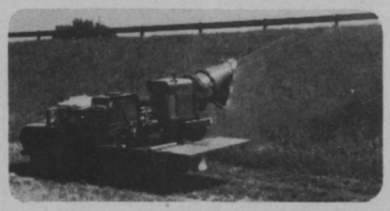
SLO-GRO®...now more than ever the key to lower mowing and pruning costs.

If rising labor costs are keeping you from doing the kind of mowing and pruning job you know should be done, maybe the answer you're looking for is Slo-Gro.

Slo-Gro is a unique chemical growth retardant that economically controls the growth of trees, grass, shrubs and ivy. In tough-to-control areas, Slo-Gro can usually do the job better, and at less expense than mechanical methods.

It's fast, systemic, safe, and produces no persistent residue. For complete details write: Uniroyal Chemical, Division of Uniroyal, Inc., Naugatuck, CT 06770.

As with any growth regulant, always follow instructions on the label.



Roadside Grass Control. Slo-Gro is recommended for use on all "commercial" turf areas that require regular maintenance, but are difficult to mow. Maintenance situations like highway medians, airfields, steep embankments, ditches, and grassed areas around fences and guard rails.

Growth Control on Trees. Slo-Gro inhibits tree growth by stopping the terminal growth of woody plants. Primary applications include control of tree size under power lines, along streets, or wherever excessive foliage is a problem.

Golf Course Maintenance. While Slo-Gro is not recommended for general use on fine grass areas such as residential or commercial lawns, it has been used extensively on golf course roughs. It can also be used in conjunction with herbicides wherever weed control is required.

The head that runs circles around everybody else's.

THE SERIES 300 STREAM ROTOR

COVERAGE . . .

- Low precipitation rate provides easy soil absorption . . . prevents wasteful wet spots and run off.
- Covers areas up to 60′ in diameter accurately, efficiently.
- Rotating streams counteracts windy conditions.
- 3″ spring-loaded pop-up nozzle . . . means efficiency even in high grass.

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- Sealed, gear-driven assembly of Du Pont Delrin® and hydraulic operation mean less wear and tear.
- Smaller, lighter than competitive heads . . . made of tough non-corrosive Cycolac®, the football helmet plastic.
- Pop-up nozzle pops down below grass level, minimizing accidents and vandalism.
- Large easily-serviced basket screen prevents plugged nozzles.

SAVINGS . . .

- Fewer heads required with up to 37′ triangular spacing.
- Fewer valves needed with wide spacing and low precipitation rate.
- Reduced installation costs.
- Improved efficiency conserves water.

The 300 Stream Rotor is offered in three sizes, with a variety of arcs. Now also available as a shrub head.

Write for a FREE descriptive booklet today:

Stream Rotor
The Toro Company, Irrigation Division
Dept. W-175, P.O. Box 489, Riverside, CA 92502

For More Details Circle (103) on Reply Card

Government News / Business

Diamond Shamrock has established a fifth regional sales office for its Agricultural Chemicals Division in Houston, Texas. The new office will handle all sales and service requests for those customers located in: New Mexico, Texas, Oklahoma, Louisiana, Mississippi, Arkansas and Western Tennessee. The new address is: 1006 Main St., Houston, Texas.

Department of Labor's 15-member Standards Advisory Committee on Agriculture has added eight new members. Labor Secretary, Peter J. Brennan, said the reconstituted committee will continue to develop and recommend to OSHA standards to protect agriculture workers from on-the-job injury and illness. The committee includes four representatives each of employees and employers, two representatives of the federal and state governments and three representatives of the general public. The eight replace former members whose terms have expired.

International Harvester recently established a Service Maintenance Agreement covering its Outdoor Power Products. The agreement is for sale with new consumer machines covering a period of one year and may be renewed for a second and third year period. The coverage becomes effective on the date of delivery as established by the company's CH 223 Warranty and Delivery Registration Form.

All pesticide producers must register with EPA regardless of where they intend to market their products. Makers and importers of pesticides for interstate commerce had to register last year under the law which set the deadline of October 21, 1974 for registering makers of products for local sale only. EPA expects 3,000 to 4,000 registrations from firms in the local category, although exact figures are not known. The purpose of the regulation is to make local pesticide standards more uniform across the country and to enable EPA to gauge what pesticides are being sold within state borders. Producers failing to comply will be subject to civil or criminal penalties.

New noise level legislation has been proposed by the Department of Labor for protection of workers against occupational noise. The new proposal would retain the present limit of 90 decibels over an eight-hour period but would initiate audiometric testing for workers exposed to 85 decibels or higher. OSHA boss, John H. Stender, said the added requirement "recognizes that comparatively more employees would be at a lower risk level if eight-hour exposures were limited to 85 decibels, but we would take into account technical feasibility and economic problems associated with the lower level." Stender proposed to retain the 90 decibel level until more data can be accumulated that clearly dictates the necessity of a change.

USDA has opened a new office to assist in registration of minor-use pesticides. EPA cooperated by assigning a man to the new office to assist in the registration program.

EPA is also increasing their pesticide labeling program for minor-use crops. Indications are that pesticides will be classified under group labeling by pest or by grouping of plants.

A burst of brilliance...
Fylking for the World's Fair!

Fylking Kentucky bluegrass is a superior, elite bluegrass that burst like a star on the scene in the sixties!

Since then Fylking has established records making it the perfect choice for the official grass at the environmental World's Fair, Expo '74.

Fylking has proven to have superior resistance to disease and drought; withstands traffic. Its thickly woven rhizome root system develops dense sod so quickly Fylking can be lifted in 90 days. Fylking can be mowed at 3/4 inch (even 1/2 inch) and thrive. It absorbs carbon dioxide pollutants, gives off oxygen, cools air by releasing water vapor.

A superior mixer, Fylking greens up earlier in spring, stays greener in summer heat, remains green longer into fall.

Choose Fylking and your customers are getting a grass good enough for a World's Fair!

FYLKING KENTUCKY BLUEGRASS

U. S. Plant Patent 2887

Another fine product of Jacklin Seed Company

Fylking's rhizome root system develops so thickly, under ideal conditions sod can be lifted in 90 DAYS.

Low growth, short leaf sheaths and abundant tillering of Fylking (right) compared with another elite bluegrass plant.

Cross section displays thick, luxuriant turf, fine leaf texture and brilliant green color of Fylking.

For More Details Circle (121) on Reply Card

One Million-Dollar Challenge

By GARY T. GRIGG
Course Superintendent
All Seasons Country Club

BEFORE THE FIRST golfer pitted his skills against the 6,607-yard-long All Seasons Country Club Golf Course, the Robert Trent Jones-designed complex already had proven itself a solid adversary.

The championship course did so almost daily throughout the 3½ years it took to sculpt it out of 100 acres of shale and flint rock along the shore of the Lake of the Ozarks in mountainous southern Missouri. Construction of the $1-million project reads like a page from Ripley's "Believe It Or Not."

Although carving the 71-par course from solid rock was the greatest challenge, our first obstacle was to clear away 150 acres of timber. However, we salvaged trees that framed or separated the 18 holes along the course's ridges, inlets and bays.

It took a year to clear the wooded land. Trees were bulldozed down and hauled away after being cut into small pieces with chain saws. Tree stumps were burned and the debris also was hauled away.

Once the land had been cleared a crew of 50 men began shaping it into the golf course Robert Trent Jones had envisioned. The first step was to level or deepen the land by blasting with dynamite. We did so because the course had been designed so every green would be visible from its tee-box.

It took almost seven months to reshape the topography and almost every hole was altered by blasting. On the 17th fairway, for example, workers blasted away almost 14 feet of solid rock.

The next task was to dig ten miles of trenches to install our Binar automatic irrigation system. We used a trenching machine and bulldozer to dig the trench in shale, but needed dynamite to rip through flint rock. A crawler-type drill punched holes in the fairways for the charge and the explosions produced a jagged trench. After cleaning the trench, we laid underground irrigation lines and packed them with sand and pea gravel so expansion of the pipe would not shaft it against the rocks.

We purchased and hauled in more than 120,000-cubic-yards of soil for the fairways. We purchased the dirt from a catfish farmer seven miles away who wanted his pond cleaned. We drained the pond, let the bed dry out in the sun and then cut a foot of silty, acidic clay soil from the bottom.

Because soil in the Ozarks has a high clay content and is acidic (4 to 4.8 pH), we put down six to eight tons of agricultural lime per acre. We added the lime by discing it into the soil, mixed it well and harrowed it. Incidentally, soil samples taken in mid-August ranged from 5.8 to 6.5 pH so the lime apparently has buffered our soil.

It cost $250,000 to acquire and haul the soil. Six trucks hauled earth around-the-clock in two ten-hour shifts from May through November 1973. Dirt was spread just prior to seeding to prevent unnecessary top soil erosion.

The greens construction was more conventional, because they were designed to conform to United State Golf Association specifications. Greens were under-drained with plastic corrigated drain on top of which we had 4 inches of gravel. Then we applied 12 inches of mix and followed the rough contours laid out by Jones and his men. The next step was to board-float the greens behind a sandtrap rake.

Jones suggested that we not use soil in our mix. The mix we used was 80 percent sand and 20 per cent peat and the greens are beautiful. In my opinion, a sand and peat mix gives great drainage and aids in deep roots. For example, our root depths ranged from eight to ten inches this year. In constructing the greens, we had to haul in 8,000-cubic-yards of sand and 1,600-cubic-yards of peat. We purchased peat from Northern Indiana.

We mixed seed with wood-fiber mulch and put plastic binder into the mulch to make it more water-resistant by binding the mulch together. We initially applied an agricultural fertilizer (12-24-12) on fairways, greens and tee-boxes to aid growth.

The mixture was blended into a water slurry in a 3,000-gallon tank mounted on a truck. The mixture was pumped onto the fairways with a high-pressure gun. Then we watered 15 minutes every two hours. Because the seed had to germinate in mulch, we continued the watering program two weeks. Incidentally, thanks to rye and the bluegrass varieties, we obtained a ground cover within a week.

(continued on page 54)

TURF TRUCKSTER SYSTEM

Because the flexibility of the Cushman Turf-Care System saves you time and money. Here's how!

The System is built around the rugged, versatile 18 hp Turf-Truckster, 3-or 4-wheel model. With this one power source and options, you can haul, spray, spike, spread and top dress. And save as much as 35% on equipment in the process.

Because, instead of buying separately powered units for each job, you buy only the Turf-Truckster and the modular Cushman accessories you need. So you pay less in total for equipment . . . and have only one power unit to maintain.

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TURF-CARE
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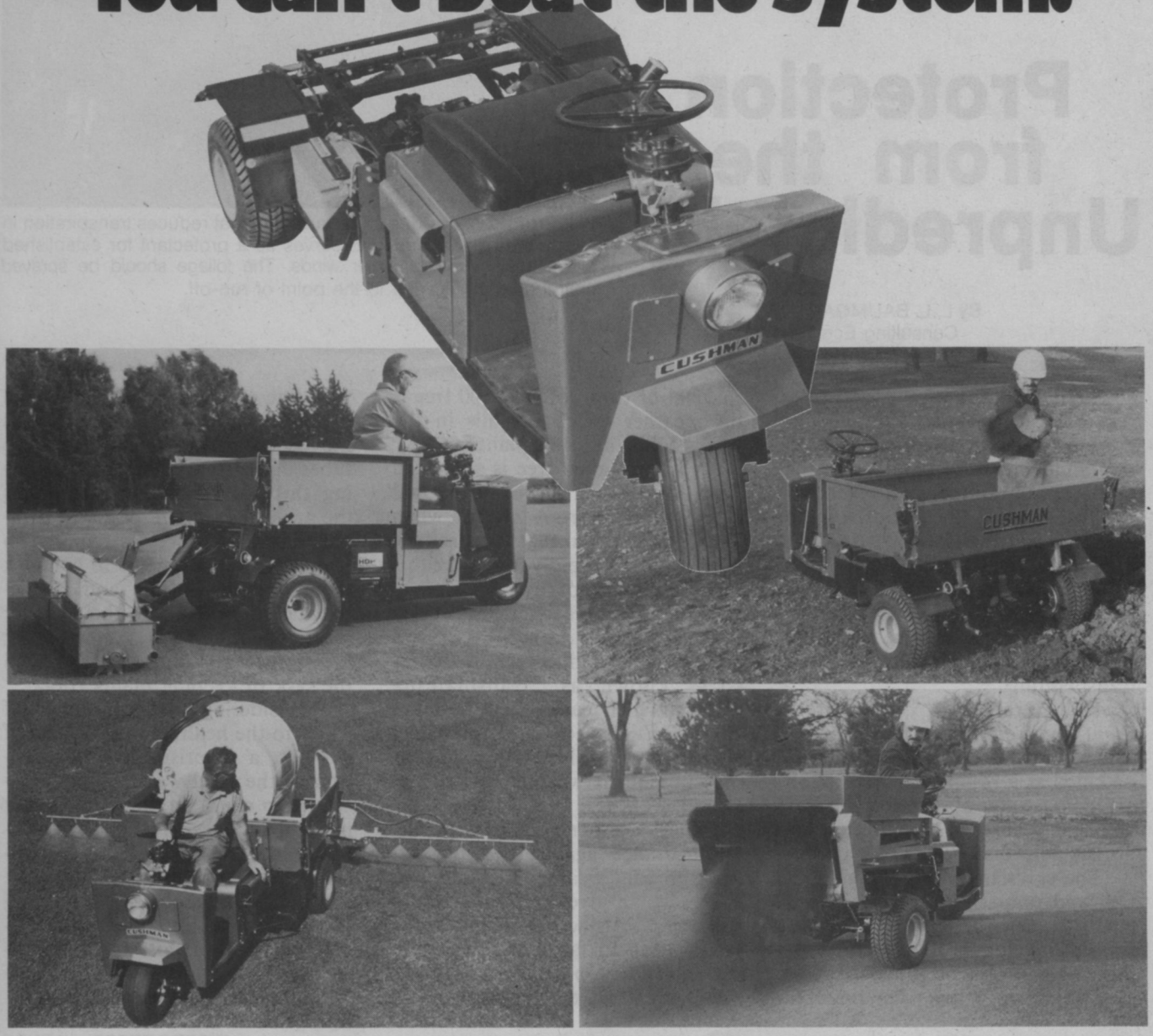
But that's not all.

The System is also a time saver that can cut your labor costs. Accessories mount on the back of the Turf-Truckster. Your men do their work quickly, efficiently . . . and then move on to the next job at speeds up to 22 mph. There's less wasted traveling time, so you get more work out of each hour of labor cost.

The Cushman Turf-Care System. Versatility, superior performance, economy. It's a tough system to beat.

Write today for your free Cushman Turf Care Catalog.

You can't beat the system.



For More Details Circle (113) on Reply Card

Wilt-Pruf NCF provides an organic film that reduces transpiration in recent transplants and also serves as a protectant for established plants against drying winter winds. The foliage should be sprayed until thoroughly wetted to the point of run-off.

Protection from the Unpredictable

By L. L. BAUMGARTNER
Consulting Ecologist

THE DEATH of a prized tree, regardless of its dollar value, is undoubtedly a great disappointment to the landowner who paid for it, the landscape architect who recommended it and the arborist who planted and cared for it. A tree that initially cost $100 to plant may easily cost $150 to replace. However, the application of $1 worth of an anti-desiccant might well have saved the tree and spared the inconvenience of transplanting.

Paul Kramer is quoted from *Plant and Soil Water Relationships* as saying "more plants are injured or killed as a result of transpiration exceeding water absorption than by any other cause." There are few arborists who disagree.

The skills involved in digging a tree and preparing a proper planting site can be controlled. The procedures for proper post-planting care can also be practiced. The one unknown factor dictating the survival or death of the $100 tree is the weather which prevails in the weeks following transplanting.

A transplanted tree is separated from 75 to 95 percent of its original water-gathering root system when dug. It is essential that it reproduce new root hairs rapidly to replace this loss. Regrowth of new roots may require only days or a few weeks. But dry weather during this critical period can produce severe water stress known as "transplanting shock" which can wilt or kill the plant. On the other hand, there may be little or no transplanting shock if the subsequent weather is wet and humid.

Since weather is unpredictable, an insurance against possible adverse growing weather is desirable to both save an investment and assure customer satisfaction. This is the justification for an anti-desiccant.

The life supporting water for a plant is extracted from the soil by very fine root hairs tightly attached to individual soil particles. It is moved upward through conductive tubes in the stem to the leaves. During this passage, water constitutes the primary medium for all the complex chemical processes required to convert simple elements to complex organic plant foods, and it distributes these foods to their proper locations in the plant. Among other functions, water is also credited with the task of keeping plants cool.

Considering the importance of water to the health and wellbeing of a plant, a surprisingly small fraction of the total water intake is essential to maintain life. Perhaps not more than five percent is incorporated into plant tissue. Nevertheless, the plant water supply must continually be replaced, or existing water must be conserved by reducing transpiration loss to an acceptable level.

(continued on page 63)

"I'VE NOTICED ON P.G.A. COURSES I'VE PLAYED THAT HARD USE AREAS SEEDED IN MANHATTAN PERENNIAL RYEGRASS HOLD UP BETTER, LOOK BETTER AND PLAY BETTER THAN OTHER GRASSES. . ."

Patrick C. Fitzsimons

Fitzsimons on CERTIFIED Manhattan

Pat Fitzsimons, who tied the world record score of 58 on a 6,000 yard course, tees off on the No. 1 Manhattan tee at Salem Golf Club course, Salem, Ore., where he shot his record score.

TURF-TYPE

PERENNIAL RYEGRASS

- GREAT FOR HARD USE AREAS
- UNIFORM DARK GREEN COLOR
- FINE TEXTURED—BLENDS WELL WITH OTHER GRASSES

Manhattan Perennial Ryegrass was selected and developed by Dr. C. Reed Funk, Rutgers University. Manhattan develops a uniform dark green leafy, dense turf with leaf blades as fine as many Kentucky bluegrasses.

Manhattan®

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Slow Release IBDU — Promising New Tests

By DR. W. H. DANIEL, Turf Specialist, Purdue University

A 31 PERCENT nitrogen source which dissolves slowly. That's what George Haddad, then of Swift & Co., told me when he first mentioned IBDU in 1967. Now, as 1974 closes, a look back into our testing in turf research accentuates the comparative values.

Through 20 different tests since 1967 in laboratory, greenhouse, experimental green and larger turf plots, solubility, releases and responses have been recorded.

It should be understood that several other workers, including O. R. Lunt of California, Don Waddington of Penn State, Gaylord Volk of Florida, Paul Rieke of Michigan State, Tom Hughes of Illinois and others have also researched IBDU as part of their programs.

What is IBDU?

IBDU is a compound with each molecule a standard size which deteriorates by hydrolysis or dissolving. Isobutylidene diurea IBDU is made as a precipitate powder and uses a by-product of film manufacture. It is very slowly soluble. According to the water insolubility tests (standard in testing of ureaforms and polyforms) IBDU is over 93% cold water in soluble. However, these tests are really designed for ureaforms, to better differentiate molecule sizes, and are inadequate for expressing IBDU characteristics. For example, the initial visual growth response is about 10 days, even when particles are applied. In contrast, the soluble (cold water soluble) fractions of ureaform as sold, show expected initial response in 3-5 days.

Another laboratory test used in nitrogen assay is a calculated Availability Index based on fast to slow release portions. When standard IBDU is ground to a fine powder, the solubility and availability are increased. See Table 1.

Solubility is Slow

When a few pellets of IBDU are placed in a beaker for several weeks and the water is changed often, the particle still appears similar. Large particles lasted more than three months as kept in water. Principle: even a low concentration in solution around the particle surfaces slows down further solution. (Like cold iced tea dissolves only so much sugar). Principle: the coarser (and denser) the particle the longer the initial supply could last. So an early question to the company was, how about a big particle for incorporating into soil during construction of new turf areas such as greens, tees and sodded or seeded home lawns?

Some Tests

In one laboratory test a finely woven nylon cloth was made into small bags and in each we placed equal portions of actual nitrogen (0.2 gm). Figure 1 shows how water was dripped onto each bag and the solution and mechanical movement of soluble portions occurred. The urea (left dish) dissolved readily and crystallized as it dried — its normal salt effect. The uramite (center) shows some salt (the limited urea present) and some fines. The IBDU has very little salts or fines.

In a greenhouse test (figure 2) nine identical bags, each containing 0.2 gm actual nitrogen, were placed into the soil of a two gallon pot of growing ryegrass. Then as normal watering, absorption, leaching and growth occurred, it was reasoned that all the available nitrogen that could move out of the bag would be adsorbed by the adjacent roots.

The portion retained in each bag was measured by retrieving the bag and its contents tested by the Kjel-

(continued on page 58)

Table 1. Water Insoluble and Availability Index of IBDU Samples.

Size after Crushing	Water Insoluble Nitrogen	Availability Index
mesh and	%	as a number
Standard as bagged	29.9	55 slowest
—14	27.3	61
—20	20.9	77
—40	20.2	97 fastest

Table 2. Comparative Yield of Bluegrass Clippings One Year After Applying IBDU

Size mm		Relative Yield
Very coarseover	2.0 (release was slow)	100%
Coarse	2-1	75
Medium	1-.5	70
Fine	.5-.25 (release was earlier)	45
Check	none	35

The new look of leadership in grounds maintenance equipment...

Hesston Front Runner® GMT

Drive wheels are well back from the mower allowing the batwings to reach. In tight areas, just raise the retractable batwings.

Vacuum Pickup attachment is self-contained. Optional 15′ snorkel vacuums hard-to-reach areas.

Front-wheel hydrostatic drive and four oversize high-flotation tires give unbelievable stability on uneven or sloping terrain.

Tackles mowing jobs head-on with up-front features

This one was designed from the turf up as a true grounds maintenance tractor with new up-front features and attachments to handle tough groundskeeping chores all year long. That's what makes the Front Runner GMT so different from scaled-down farm tractors designed primarily to pull implements. Its cockpit and attachments are up front where they belong for unrestricted visibility. Front-wheel hydrostatic drive provides sure-footed stability and one-lever control of instant forward/reverse and infinitely variable speeds to 11 mph. Articulated steering gives exceptional maneuverability to work easily in tight areas and around obstacles. Choose from 16 or 19.8 hp models.

Cut the grass before the tires flatten it with 48", 60" or giant 80" batwing mower heads. All are front-mounted and hydraulically operated. Mower heads float to follow ground contours, prevent scalping and allow a smooth, level mowing job. Vacuum Pickup attachment gathers clippings as you mow and deposits them into its own 20-bushel collection box — no need for a trailer. You won't find another mower with all the up-front features the Hesston Front Runner has to offer, and we're willing to prove it. Ask your Front Runner dealer for a demonstration.

For mowing, vacuum pickup, snow removal, earth moving, the Front Runner is the new look of leadership in grounds maintenance equipment.

HESSTON®
LAWN EQUIPMENT

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Phone 317 352-0193

Please send me more information on the Hesston Front Runner GMT and the name of my nearest dealer.

Name _____
Company _____
Address _____ Phone _____
Town _____ State _____ Zip _____

For More Details Circle (116) on Reply Card

Pennfine Perennial Ryegrass.

Maybe it's got a weakness, but nobody's found it yet.

For three years now, the professional turf community has been putting certified Pennfine Perennial Ryegrass to the test. The results are in:

Pennfine has consistently outperformed other fine-leafed ryegrasses in trials from Pennsylvania to Florida.

More importantly, Pennfine has consistently matched or exceeded the expectations of turf management people on golf courses, athletic fields, sod farms, parks, cemeteries and public grounds from Maine to California.

No one has reported a real weakness. All the characteristics the Penn State researchers were seeking when they developed Pennfine have proven out in actual application.

Soft fibres to facilitate mowability were the foremost consideration in breeding Pennfine. Both trial data and feedback from the professionals who've used it indicate that Pennfine is the cleanest cutting ryegrass available today.

Pennfine's excellent disease resistance, exceptional decumbency, persistence under a variety of management conditions, fine texture and compatibility with both Kentucky Bluegrass and fine fescue have also been demonstrated. And in the production fields of the Pacific Northwest, a major effort is being made to meet the already heavy demand for certified Pennfine Perennial Ryegrass.

If you would like specific information, write: Pennfine Perennial Ryegrass, P.O. Box 923, Minneapolis, Minnesota 55440.

Pictured is one of the select seed production fields of the Pacific Northwest – this one in the Willamette Valley of Oregon – where certified Pennfine Perennial Ryegrass is produced under controlled growing conditions.

Test it yourself, on your own turf with the new Pennfine Test Kit.

It's free. And it contains enough seed to develop a 100 sq. ft. Pennfine test plot, along with technical data and evaluation sheets. So now you can see for yourself, under your own conditions, if Pennfine is really as good as we say it is. You will be able to test it for establishment, mowability, management requirements, persistence and any other qualities that interest you.

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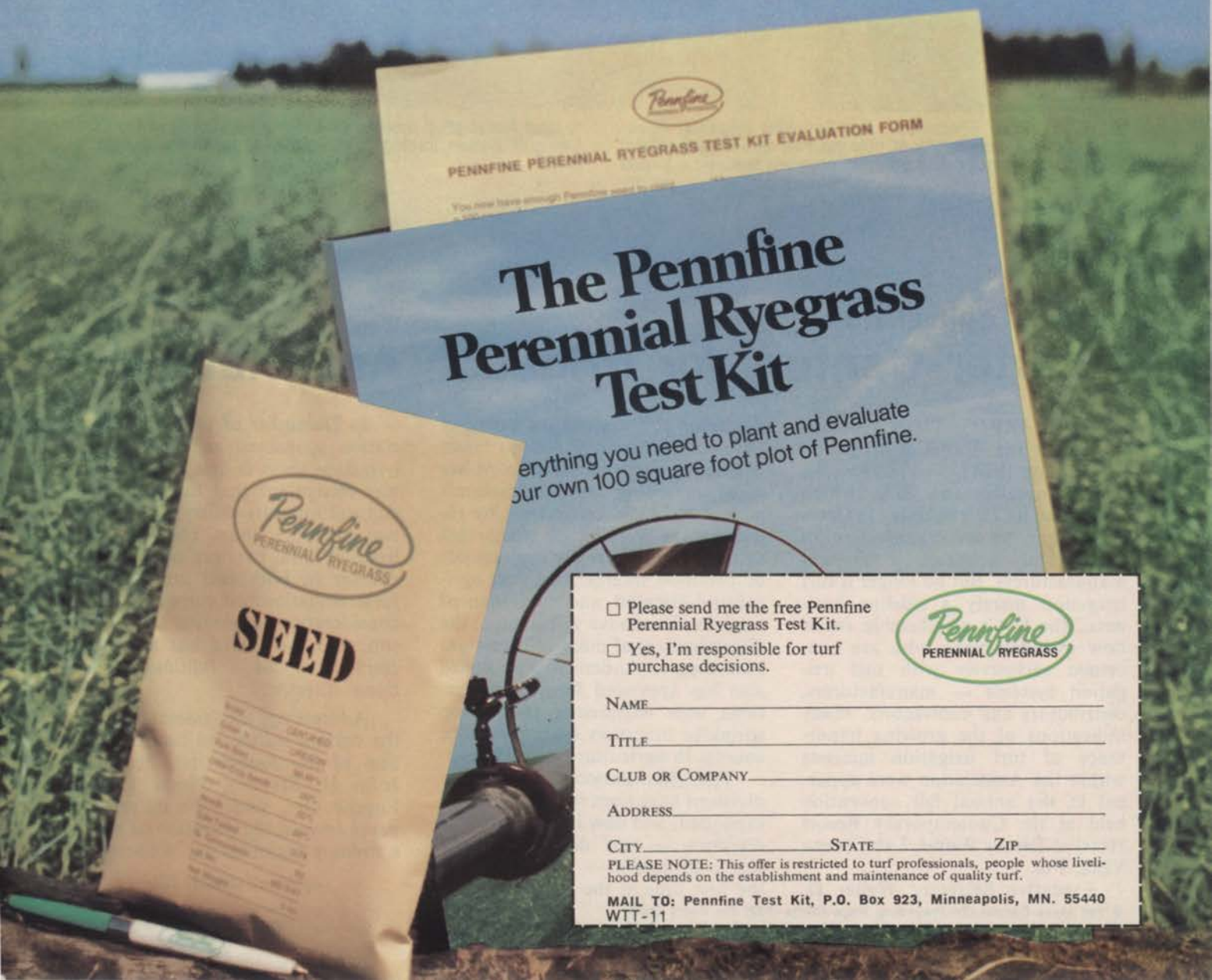

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MAIL TO: Pennfine Test Kit, P.O. Box 923, Minneapolis, MN. 55440
WTT-11

A. R. J. (Bud) Friedmann, the Sprinkler Irrigation Association's (SIA) first president, cuts the 25th anniversary cake at the annual banquet. The banquet program featured a tribute to past Association presidents and a slide show, narrated by Lewis W. Barton, tracing 25 years of SIA growth and development.

FLORIDA CONVENTION:

Quarter-Century for Irrigation Association

TURF IRRIGATION has come of age in the Sprinkler Irrigation Association (SIA).

Historically, the SIA, which celebrated its 25th birthday in October, began as an organization of agricultural irrigation equipment manufacturers. But no longer is turf irrigation merely a sideline business. The SIA's membership roster now includes many who are concerned exclusively with turf irrigation systems — manufacturers, distributors and contractors. Many indications of the growing importance of turf irrigation interests within the Association were apparent at the annual fall convention held at the Contemporary Resort Hotel at Disney World, Lake Buena Vista, Fla.

Executive Secretary Walter D. Anderson commended the Board of Directors for several actions taken during the past year. The Board has acted regarding the Association's annual technical conference by requiring the holding of concurrent sessions when there are subjects not of common interest, such as agricultural-oriented and turf-oriented sessions. This move will result in the dissemination of more information, according to Anderson. The Board also has approved further negotiations with universities to develop sprinkler irrigation correspondence courses in agriculture and turf.

The Association's commodity divisions have been restructured and expanded, and now include two turf divisions — turf distributors and turf contractors — which met for the first time at the convention.

In December of 1973, the Association sponsored an experimental irrigation short course. However, it was recognized that turf and agricultural interests differ, so in 1974, two separate short courses were held. Plans for regional short courses in both turf and agricultural irrigation are currently under consideration, according to Anderson, and the Board has approved employment of a fulltime educational director.

Addressing the assemblage on the current status and future direction of the Association, President John H. Stevens, Pierce Corp., Eugene, Ore., said: "We are rapidly going toward the direction of being a training organization. We are also

(continued on page 22)

◀ For More Details On Preceding Page Circle (132) On Reply Card

TALK

to us at the GCSAA Show – Booth 119-120 in
New Orleans, February 16-21.

A lot of people are talking about us these days. And no wonder.

For the past 70 years, we've worked hard to develop and maintain unsurpassed quality control. New and better seed varieties. Strict laboratory supervision. Excellent seed purity and germination.

The results speak for themselves. We are now the proud developers and producers of Bonnieblue, Sydsport, Majestic and Birka Kentucky Bluegrasses; Koket Chewings Fescue; Lamora Perennial Ryegrass.

We have also become distributors for fine quality seeds from the Northwest: Kentucky bluegrass, perennial ryegrass, annual ryegrass, orchardgrass, red fescue, tall fescue, bentgrass, Timothy, clover and vetch.

So if you're talking more about us these days... maybe it's because we're giving you a lot more to say.

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Start your Total Turf Care this year with Dacthal W-75 herbicide. Or use the convenient 5 percent granular form if you like.

Dacthal gets the jump on most annual grasses and broadleaf weeds. This preemergence herbicide prevents weeds as they germinate. Crabgrass and *Poa annua* don't have a chance. Yet, Dacthal is a truly selective herbicide that will not affect established grass. It's even safe for new grass when used according to label directions.

Just one application in early spring will control weeds for a full season. In the case of *Poa annua,* another application in late summer keeps this late germinating pest out of sight.

Don't worry about residue build-up either. Dacthal degrades in one season; it's not persistent in the soil.

Dacamine®

For those areas where broadleaf weeds are a problem, use Dacamine Turf herbicide to sustain your Total Turf Care. Postemergence Dacamine kills dandelion, plantain, poison ivy, knotweed and other broadleaf weeds.

Dacamine is an oil soluble diamine form of 2,4-D which is formulated to be used *only* with water. It combines the weed-killing power of an ester with the safety of an amine. Dacamine stays put—kills the weeds you spray it on but won't vaporize and damage valuable plants nearby. Its unique formulation penetrates waxy weed foliage—then moves all the way to the roots, killing the whole plant not just the top.

Daconil 2787®

Total Turf Care includes broad-spectrum disease control. Daconil 2787 is the one fungicide that solves most disease problems. Why use a group of fungicides to do what Daconil 2787 can do by itself?

Use Daconil 2787 to prevent or cure: Brown Patch, Copper Spot, Dollar Spot, Leaf Spot, Melting Out, Red Thread and more. Many leading golf courses use Daconil 2787 in their disease prevention program.

Daconil 2787 has performed well on over 25 grass species and varieties. Excellent turf tolerance allows you to use it even in hot, humid weather.

Just mix Daconil 2787 with water and spray. You don't need a surfactant. It's compatible with many commonly-used pesticides. Follow label directions for exact usage.

Daconate®

Round out your Total Turf Care with Daconate postemergence herbicide. Get those escape weeds that slipped by your preemerge. Daconate will effectively control crabgrass, chickweed, wood sorrel and other hard-to-kill weeds. It's economical, too.

Daconate is a ready-to-use arsonate liquid, pre-mixed with the right amount of surfactant for maximum coverage and control. Since it is an organic arsenic compound, it does not have the more toxic properties of inorganic arsenic compounds, such as calcium or lead arsenate. For best results, spray Daconate during warm weather when weeds are actively growing.

Ask your turf chemicals supplier for more information or write: Agricultural Chemicals Division, Diamond Shamrock Chemical Company, 1100 Superior Avenue, Cleveland, Ohio 44114.

Diamond Shamrock

IRRIGATION *(from page 18)*

saying that we are interested in regional problems. What's better than an association that's interested in its industry? We're international, but we are taking a regional approach. The only way to avoid fragmentation [within the Association] is to make sure that we take care of all segments of the industry.

"I really feel that this Association will grow more rapidly in the next 25 years. But we have to make sure that the SIA grows at least as fast as the industry. Now with the crises and shortages, we have to make sure that we keep this Association going and growing. We have in the past, and I hope that in the coming years we'll keep on that path."

In 1970, the Turf Interests Committee was established to aid in developing turf-oriented programs within the SIA. Committee Chairman Chet A. Sarsfield, Irrigation Technical Services, Lafayette, Calif., reported that "Recommended Installation Specifications: Sprinkler Irrigation Systems for Turf and Landscaping," had been published in July, 1974. According to Sarsfield, the booklet, incorporating completely new material, is being well received.

1975 should see increased attention to turf irrigation as the SIA plans publication of the 4th edition of "Sprinkler Irrigation" which will include extensive turf irrigation material for the first time in the textbook's 10-year history. Another publication in the works, "SIA Wastewater Resources Manual," will include material pertinent to the use of waste effluents in land application on turf installations through the use of sprinkler irrigation.

The 1975 executive committee of the Sprinkler Irrigation Association: (left to right) John H. Stevens, Pierce Corporation, Eugene, Ore., past president; James D. Pichon, Lockwood Corporation, Zephyr Cove, Nev., president; W. J. Ogle, Gifford-Hill and Co., Lubbock, Tex., vice president and president-elect; and Taylor Ramsey, United Pipe and Supply Co., Eugene, Ore., treasurer.

An integral part of each year's convention is the Business Management Seminar which is primarily designed to assist the small- and medium-sized businessman in his day-to-day operations.

Lew Hammer, president-elect of Associated Landscape Contractors of America and owner of Lew Hammer, Inc., Denver, Colo., opened the seminar by talking about operating cost surveys or "cost-of-doing-business" surveys. Hammer explained how his organization has conducted such a survey and how it can be used as a tool for making good business decisions. Don Cartwright, manager of the Orlando, Fla., office of Kelly Services, Inc., discussed hiring procedures, temporary help, and the hidden costs of putting people on your payroll. Tommy C. Miller, of NCR Company, Dayton, Ohio, described computer services for the small business. Dennis Petruzzelli, district reporting manager for Dun & Bradstreet, Inc., Tampa, Fla., talked about causes of business failure as he delineated nine major "pitfalls" of going into business and nine ways of avoiding business failure.

New officers of the Association are as follows: president, James D. Pichon, Lockwood Corp., Zephyr Cove, Nev.; vice president and president-elect, W. J. (Jack) Ogle, Gifford-Hill and Co., Inc., Lubbock, Tex.; and treasurer, Taylor Ramsey, United Pipe and Supply Co., Eugene, Ore.

Joining the Board of Directors are Joseph B. Fiala, Waterman Industries, Inc., Exeter, Calif.; W. J. (Jack) Liddell, Delta Irrigation Co., Memphis, Tenn.; Ed Newbegin, R. M. Wade and Co., Portland, Ore.; R. A. (Al) Wahl, Valmont Industries, Inc., Valley, Neb.; and Ray York, Ewing Irrigation Products, San Leandro, Calif., who was appointed to replace Taylor Ramsey.

The 1975 SIA Technical Conference, Feb. 23 to 25 at the Hyatt Regency Atlanta, Atlanta, Ga., will feature general sessions, combined sessions on automation of sprinkler irrigation systems and sprinkler irrigation waste water land application systems, as well as concurrent sessions on mechanical-move, turf and drip irrigation.

For more information and registration forms, write the Sprinkler Irrigation Association, 13975 Connecticut Ave., Silver Spring, Md. 20906.

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RENEWAL

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MAY WE HEAR FROM YOU TODAY? The attached card (left) is for your use. Please check the type of business you are engaged in, sign the card and drop it in the mail. We'll do the rest. We want your continued support. Thank you, Arthur V. Edwards, Publisher.

(This renewal notice is a requirement of our national auditing service to verify that you are a member of the industry and that you wish to receive the magazine.)

guest editorial

Editor's note: During recent months, the question of non-farm fertilizer usage has come under fire from all sides, including the media. The following is a reprint of a letter written by Tom A. Bayley of The Bishop Company, Lebanon, Pa.

The recent study by the American Plant Food Control Officials, a body composed of fertilizer regulatory officials in each state, shows that only about 3.5% of total U. S. fertilizer used goes for non-farm purposes. Based on last year's 47 million tons total consumption, this would mean only 1.6 million tons went for all non-farm purposes. These non-farm uses include everything from airport runway de-icing to vegetable gardens, public parks, highway shoulder stabilization and golf courses.

In terms of world wide fertilizer use, U. S. non-farm consumption was only ¾ of 1% of the estimated world nutrient tons consumed. A nutrient ton expresses a fertilizer ton for its nitrogen, phosphate and potash value only. Thus the 1.6 million fertilizer tons in U.S. non-farm use is expressed as 600,000 nutrient tons or ¾ of 1% of the 80 million world nutrient tons used.

It should also be kept in mind that U. S. non-farm fertilizer statistics included tons of dried sewerage sludge, dried manure, bone meal and nitrogen in a water insoluble form not practical for farm use.

No one in his right mind can contest the priority of feeding people. However, effective problem solving requires a reasonable examination of problem cause-effect and solution cost-benefit.

The diversion of ¾ of 1% of world fertilizer does not seem to be a significant area for finding the solution to the world's need. Especially when non-farm fertilizers cost much more than farm type products due to their specialized formulating processes.

The economics of the situation are expressed in a statement by Robert W. Steiner, fertilizer coordinator for the United Nations Food and Agricultural Organization. He said, "It is unrealistic to

(continued on page 73)

"We found the BOWIE HYDRO-MULCHER ideal for erosion control and establishment of new turf on the difficult terrain we have here at Sun Valley."

Kenny Zimmerman • Director of Golf and Grounds • Sun Valley, Idaho

Kenny Zimmerman, Director of Golf and Grounds, Sun Valley Company, Inc., is responsible for the summer maintenance of Bald Mountain's ski slopes, 40 acres of hotel, grounds and 105 acres of golf course. He needed a seeding unit that would give quick growing results to prevent soil erosion and yet be completely adaptable to the rugged terrain. He found his answer in the Bowie Hydro-Mulcher.

Whatever your seeding problems, Bowie Hydro-Mulcher has the answer. Get the kind of ground cover you want and stop erosion fast. Ideal for landscaping, greens, lawns, roadsides, steep slopes and everywhere. The Bowie Hydro-Mulcher plants, seeds, sprigs, fertilizes, waters, sprays and mulches all in one easy operation. Get the facts and you'll get Bowie Hydro-Mulcher!

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The Palmer House will be the site of the American Association of Nurserymen's Centennial Convention, to be held July 19-23, 1975, in Chicago, Ill. The theme for this 100th birthday celebration is "100 years of Green Survival."

Nurserymen Urge Congress To Temper Fertilizer Policies

The American Association of Nurseryman (AAN) have notified all Congressmen by mail to call attention to the serious consequences of the fertilizer shortage on the nursery industry and the nation.

The mailing, which explained AAN's Green Survival Program and included a litter bag, pin, Green Survival booklet and a Colorado Blue Spruce, pointed out that there is a dark side to the Green Survival concept of using plant materials for environmental improvement and energy conservation.

"Green Survival," Robert F. Lederer, AAN executive vice president, told the Congressmen, "would be seriously affected by the growing sentiment that chemicals and fertilizers which are essential to the production of green growing things should be restricted to a single facet of agriculture — the growing of food products.

"Such a point of view must be carefully considered in the light of man's heavy dependence on nature's gifts of all green, growing things. If serious shortages of fertilizer are to be with us for an extended time, a well-rounded policy must be developed — one of moderation, not exclusion."

According to the Green Survival program (which recently was officially recognized as a Bicentennial project by the American Revolution Bicentennial Administration), trees, shrubs, grass and groundcovers are major factors in the prevention of soil erosion. In addition, they serve as nature's most efficient dust traps and act as effective sight and sound-barriers. Plant materials efficiently conserve energy by shading homes and buildings from summer's heat and then, shedding their leaves for winter, allowing sunlight to heat buildings when it is most needed.

According to an AAN spokesman, reaction to the Congressional mailing has been quite favorable.

Shade Tree Federation Supports Arbor Day

Harry J. Banker, president of the New Jersey Federation of Shade Tree Commissions, said he will immediately appoint committees to review the various Labor Utility and EPA laws which seriously affect operations of Shade Tree Commissions and Departments and commercial arborists.

Banker also said that plans are underway for the Federation's Golden Anniversary meeting to be held at the Sheraton Poste Inn in Cherry Hill, N.J., this year.

Banker, who is also executive secretary of the National Arbor Day Committee and was instrumental in securing passage of bills which resulted in the President's proclaiming the last Friday in April as National Arbor Day, said he will urge greater observance of Arbor Day by Federation members and New Jersey communities this year.

At the Alden Evergreen Nurseries near Buffalo, N.Y., finely shredded topsoil is produced at the rate of 100-plus cubic yards an hour with a Kemp Soil Shredder. Soil is dumped into the shredder, a cubic yard or more at a time. A drum at the bottom of the hopper, revolving at 125 rpm, feeds soil to 165 shredding teeth on a second drum moving at 850 rpm. Because of their greater weight, stones are thrown beyond the soil pile, separating them from the finished product.

28th Weed Society Meeting Slated for Memphis, Tenn.

"Weed Science — Shortcut to Energy Conservation" is the theme for the 28th annual meeting of the Southern Weed Science Society, Southern Peabody Hotel, Memphis, Tenn., Jan. 21-23.

The meeting will feature concurrent sessions on weed control in such areas as agronomic crops including turf and pastures, horticultural crops, forests and rangelands, rights-of-way and industrial sites, and aquatic environments.

A special symposium on "Weed Control — Now and in the Future," is included in the first general session. Hal Traube, vice president and general manager of Stauffer Chemical Corporation's Agricultural Division, will discuss "Energy Shortages and the Pesticide Supply Outlook for 1975."

NPCA To Sponsor Clinic On Outdoor Pest Services

The first outdoor pest services clinic sponsored by the National Pest Control Association (NPCA) will be Feb. 28-March 1 at Stephenson Chemical Company training center, College Park, Ga. Curriculum includes lawn services, ornamental plant and tree services, weed control and the future of growth regulation. Registration is $45 for NPCA members and $55 for nonmembers. For more information, contact Donna Froehlich, Manager of Meetings and Conferences, NPCA, 8150 Leesburg Pike, Vienna, Va. 22180.

National Club Association To Convene in Washington

The annual conference of the National Club Association (NCA) is scheduled April 13-15 at the Shoreham Hotel in Washington, D.C. according to Gerard F. Hurley, executive director.

More than 300 of the officers, directors, managers and owners of private clubs in the U.S. along with leading supplier and developer representatives are expected to attend.

Special features of the two-day meeting include a Capitol Hill lunch in the Senate Caucus Room with Senator Henry M. Jackson as the keynote speaker.

NCA seminars will center on management and administrative topics concerning both the Association and the private club industry. Federal legislation and regulation, particularly taxation, will receive heavy emphasis.

Conference registration of $125 for members and $75 for their spouses includes all receptions and meals. Representatives of private clubs who are not NCA members are encouraged to attend.

For more information, contact NCA, 1129 20th St., NW, Washington, D.C. 20036.

Landscapers' Association 'Gear Up' for Fla. Meeting

"Gearing Up for Profits," the theme of the 1975 annual meeting of the Associated Landscape Contractors of America (ALCA), is geared up and ready to go, Jan. 27-31, in St. Petersburg, Fla.

A line-up of speakers representing the equipment industry will be on hand to tell the attendants what to do with their present equipment, how to operate it more efficiently, how to maintain it to get the most use out of it, and what to expect in the future. Speakers will include

(continued on page 50)

Those involved with the actual presentation of the California Fertilizer Association's (CFA) $1,000 check to the Southern California Turfgrass Council (SCTC) for turfgrass research are (from left) David Mitts, CFA; O. V. (Chip) Morgan, SCTC; and Robert Whiting, CFA.

California Fertilizer Association Supports Turfgrass Research Programs

Turfgrass research work was given a financial boost in November when the Soil Improvement Committee of the California Fertilizer Association (CFA) presented the Southern California Turfgrass Council $1,000 to bolster its Trust Fund for turfgrass research.

The Council established the fund last year and has contributed $6,000 to a research program now underway at the South Coast Field Station in Santa Ana, Calif., under the direction of Victor B. Younger and Victor A. Gibeault of the University of California Cooperative Extension.

On hand to present the check at the Council's meeting were David Mitts, vice president, and Robert Whiting, Soil Improvement Committee chairman, of CFA. Mitts is products director for Bandini Fertilizer Co., and Whiting is an agronomist with Union/Collier.

Accepting the donation on behalf of the Council was O. V. (Chip) Morgan, chairman of the Council's Trust Fund Committee and a past president of the organization, who said "we welcome any industry or individual contributions to this fund which is earmarked solely for turfgrass research work." Morgan is institutional sales manager for Bandini Fertilizer Co., Los Angeles, Calif.

IBDU works slower doesn't have to

Sometimes the penalty you pay for well-fed turf is constant mowing. Especially when the weather's hot and your grass gorges itself on extra nitrogen.

IBDU gives you a lot of green without a lot of growth. It feeds your turf slowly and steadily, regardless of the weather. IBDU is activated by water, while other slow release fertilizers depend on temperature and bacteria. The hotter it is, the faster they release. With IBDU, each hot day doesn't send you running for the mower shed.

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WTT-1

LETTERS TO THE EDITOR

Editor's Note: The following letter is addressed to Merle P. Meyer, Director of University of Minnesota's Remote Sensing Laboratory. William E. Wildman, co-author of the infrared photography article, is responsing to Mr. Merle. Merle's letter appeared in the December issue of WEEDS TREES AND TURF.

Dear Dr. Meyer:

I'm sorry that you felt our article "Infrared Aerial Photography — Easier Than You Think" conveyed the impression that color infrared film is heat sensitive. Actually, we say exactly the opposite in the third paragraph: "Infrared color or black and white films do not record thermal infrared, but are sensitve to the 'near infrared' radiation which is reflected from objects. The near infrared reflectance is not a function of the temperature of the object."

Many inexperienced people assume that color infrared film shows temperature differences, and we were trying to correct this widespread erroneous impression. In hindsight, rearrangement of the paragraph would make this more clear. But careful reading of the paragraph should still convey the idea that color infrared film is not heat sensitive.

I suspect that "previsual detection" is a matter of degree. In many cases, I find that a particular plant growth problem that is somewhat visible to the eye and detectable on color film, is detectable in greater contrast on color infrared film. In a few instances, the color infrared film has detected a much broader area of adversely affected plant growth that could be seen on the corresponding color film. A case in point is the color and color infrared pair showing black pine needle scale that was used on the cover of the October issue of WEEDS TREES AND TURF. At that particular position and scale of photography, we could detect many more diseased trees with infrared film than we could with color film. I think it is fair to call this "previsual detection."

I understand from Mr. Neil Howarth of Missoula, Montana, that you have written some articles on 35 mm infrared aerial photography. I would appreciate receiving copies of these publications if they are available. **William E. Wildman, Extension Soils Specialist, University of California.**

Dear Sir:

I would like to compliment your magazine of the fine article in the May 1974 edition by Mr. Wallace A. Mitcheltree: "Getting Acceptable Job Performance From Your Employees".

Good job performance is what we are all after today with the economic status the way it is. But articles of this caliber are too far and in between.

Once again, let me compliment you and Mr. Micheltree for this article and please keep the good work up. Thank you. **Wesley Taylor, Superintendent, Oaklawn Cemetery Association.**

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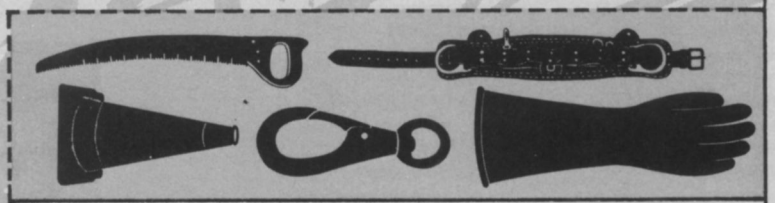

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Systemic Fungicides— their role in turf disease control

By DR. R. W. SMILEY
Turf Pathologist
Cornell University

SYSTEMIC FUNGICIDE technology has advanced very rapidly during the past five years. Development of this new class of fungicides has made it necessary to drastically alter the methods of application which proved efficient for contact fungicides. Yet, it is not uncommon to still find pesticide applicators using the systemics as they would the older contact fungicides.

Systemic vs Contact Fungicides

Contact fungicides such as Dyrene, Daconil, Thiram, Fore and others are sprayed onto leaf blades to prevent fungi from infecting the turf. The contact fungicides must be reapplied frequently to protect newly emerging portions of the leaf. If the spray is not uniformly distributed over the leaves, small areas that are left unprotected will still provide avenues of entry for the fungi. These protectant chemicals seldom kill the fungi which have penetrated the leaf, and they are therefore inefficient in stopping the spread of existing infections. These pesticides are effective against a wide range of pathogens which attack the turf foliage, but they do not protect the root and crowns of turf. Contact fungicides do not enter the plant and if they did they would probably be toxic to the turf.

The systemic fungicides differ in chemistry from the contact fungicides. They are designed to be absorbed by the plant and therefore must not be highly phytotoxic at recommended rates of application. Despite the inherent safety to plants, overdoses can be taken up and result in injury to the turf. Excess use of the systemics can lead to phytotoxicity and the residual concentrations in soil may accumulate through any one growing season.

Systemic fungicides have many valuable attributes. All except thiabendazole are among the safest pesticides on the market as far as oral and dermal toxicity to humans and other animals is concerned. When applied as a soil drench, the systemics are capable of protecting root and crown tissues from disease and they require less frequent applications than the contact fungicides. If they are applied to foliage, they must be applied as frequently as other foliar protectant-types of fungicides. Whereas the contacts remain outside the leaf surface, foliar applied systemics penetrate into the leaf tissues and act curatively as chemotherapeutants to kill the fungi which have already infected the leaf. For this reason, application of systemics can be delayed until symptoms of foliar diseases just become apparent, thus eliminating the need for costly preventative treatments. With root-infecting fungi which cause stripe smut and Fusarium blight, the use of preventative treatments is preferred since root damage is well advanced before foliar symptoms become apparent.

The systemic fungicides are more selective than most of the contacts. Systemics that are currently available for use on turf are not effective against *Pythium, Helminthosporium,* and against the fungi which cause rusts, fairy rings and several other turf diseases. The diseases caused by these organisms may therefore become more severe, if left untreated, in areas where systemics form a dominant part of the fungicide program. In the future it is likely that systemics can be developed for control of these fungi which are insensitive to currently available sysetmic fungicides.

Turf Systemics on the Market

Benomyl (Tersan 1991):methyl l-(butylcarbamoyl)-2-benzimidazole carbamate

Methyl Thiophanate (Fungo, Spot-Kleen):dimethyl 4,4'-o-phenylene bis (3-thioallophanate)

Ethyl Thiophanate (CL 3336): diethyl 4,4' -o-phenylene bis (3-thioallophanate)

Thiabendazole (Mertect 140, TBZ):2-(4-thiazolyl) benzimidazole

In order to understand why certain application techniques must be used, it is first necessary to know at least something about the chemistry of these fungicides. Benomyl and methyl thiophanate are not in themselves the active fungitoxic chemical structure sought for control of turf diseases. These fungicides must first be converted (by chemical hydrolysis) to the fungitoxic chemical methyl benzimidazole carbamate (MBC). Ethyl thiophanate hydrolyzes into the ethyl analog called EBC. Hydrolysis can occur in an open bag, on standing in a spray tank, in the soil, or in the plant. The speed of root absorption, and the relative effectiveness of these fungicides inside the plant parallels their relative rates of hydrolysis. Benomyl hydrolyzes far more rapidly than the

(continued)

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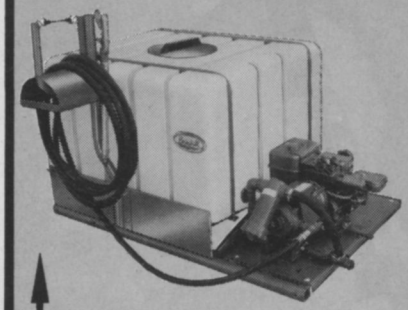

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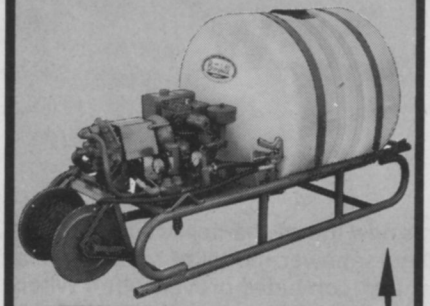

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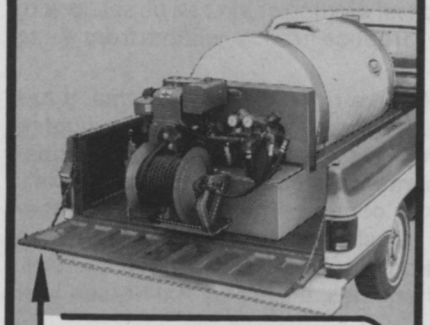

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thiophanates, thus helping to explain its greater activity as a curative agent. Compared to the formulated parent fungicides, substantially lower amounts of the hydrolysis products MBC and EBC penetrate the foliage and move systemically in the plant. The penetration of thiabendazole is comparable to that of MBC and EBC. Although the fungitoxicity of methyl thiophanate is lower than for benomyl, it is greater than that of ethyl thiophanate because the methyl form has a slightly more rapid hydrolysis rate than the ethyl form, and because the fungitoxicity of MBC exceeds that of EBC. Thiabendazole is the least fungitoxic of the systemic fungicides discussed here.

When benomyl or thiophanate molecules are absorbed by roots, some of the chemical is stored in the root and released gradually as MBC and EBC. This provides a slow release of the fungitoxic factor, and thus long-term protection of the plant. If hydrolysis occurs outside the root, the MBC or EBC released by the soil is absorbed very rapidly and quickly passes through the plant, thus affording a shorter interval of protection. Since hydrolysis occurs in opened bags stored under humid conditions, one could expect that when these materials are used, they will be less efficient than those stored in unopened bags. This may be particularly important for granular formulations of systemic fungicides.

Application vs Efficiency

Systemic fungicides may be used as foliar sprays or as soil drenches. With the foliar application, the duration for activity of systemic fungicides is no longer than that of the contact fungicides, but because they enter the leaf and kill the fungi inside, their efficiency is somewhat greater than for the contacts. With both eypes of fungicides, the fungitoxicity is limited to the portions of the leaf that were actually treated. Foliar application of systemic fungicides offers no protection to roots and to newly emerging leaf tissue.

Efficient utilization of the full fungitoxic potential of systemic fungicides is achieved only through precisely controlled drenching applications. An understanding of the complexities involved in properly applying these fungicides to soil

(continued)

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is perhaps the most important concept needed for their efficient use on a day to day basis. These fungicides adhere strongly to organic matter and clay minerals in soil. If they are allowed to dry even briefly on the leaf blade, in the thatch, or at the surface, a large amount of the efficiency will be lost. Delayed watering fails to move the chemicals from the sites where they dried to the root zone. Root density is much greater in soil below the thatch layer than in the thatch. A further complication is that the surface soil layer and the thatch are subject to periodic drying and moisture is required for the roots to absorb the fungicide. In drenching applications, it is important to know that improper drenching can leave the chemical where it is unavailable to the roots.

Special precautions are needed to prevent improper drenching applications on hot, dry days when the fungicide can dry onto the leaf blades or thatch within several minutes. It is helpful to wet the grass thoroughly before starting the application, and again during the job if the areas that were treated first are tending to dry. Drenching with one-half to one-inch of water should begin immediately after the application is completed. If a chemical residue is visable on the leaf blades when they dry after drenching, much of the efficiency has been lost. The practical difficulties with keeping the grass wet until drenching has been completed can be minimized by applying systemic fungicides very early in the morning while dew is on the leaf blades, or during a steady light rainfall.

Optimal efficiency depends upon uniformly distributing the fungicide in the soil. To aid in uniform distribution, it is advisable to minimize the penetration problems by removing excess thatch and wetting the soil thoroughly about three days before treatment. Water applied to dry soil first flows through the largest pores and passages, and then slowly wets the smaller pores. Drenching the fungicide into a dry soil may cause the chemical to be nonuniformly deposited primarily along the larger pores and passages of soil. This reduces the availability of the fungicide to many roots.

Systemic fungicides adhere more tightly to acid soils than to alkaline soils. Excess soil acidity should therefore reduce the actual amount of these fungicides that can be absorbed by roots immediately after application. Excess soil acidity also increases the rate of hydrolysis, thus further decreasing the efficiency of fungicide utilization. This is especially important for control of root-infecting fungi which require high initial concentrations of the fungicide.

The optimal time to apply systemic fungicides is just before the rapid phase of epidemic build-up. Thus, in areas where Fusarium blight generally becomes visually apparent by early July, the optimal application time is in mid-to-late-June when early infection is occurring. As applications are delayed beyond mid-June, the fungicide will be less efficient. The fungus which causes stripe smut lives inside living grass plants during the winter. New infections and symptom development occurs in the Spring. Optimal timing of treatments is in the late-Fall to eradicate the overwintering fungus and in the early Spring before the grass begins to green up to prevent new infections. For foliar diseases, the optimal timing is immediately after they can be seen.

Fate of Systemic Fungicides

Systemic fungicides are only translocated upward from the point of absorption. Foliar applications therefore protect against foliar-infecting fungi, but not against the root infecting fungi. The fungicides migrate toward the upper edges of leaves, and a little may even be exuded from the leaf. The fungicide that is exuded could conceivably be recycled through the plant again if it gets into the root zone before being absorbed on the thatch or soil surface. The fungicide remaining in the leaf clippings probably becomes ineffective for future protection of living plants. Some fungicide could be leached below the root zone in very sandy soils that are devoid of organic matter, but this would not be a problem in most turfgrass soils. The fungicide which is absorbed to soil degrades very slowly. About one-half of it is degraded within the first six months. This means that repeated heavy applications may accumulate to reach phytotoxic concentrations.

Fungal Resistance to Systemic Fungicides

We can expect fungi to become resistant to rather specific fungicides such as the systemics because they inhibit only one event in the metabolism of the fungus. A simple mutation of one gene can lead to a strain of the fungus that is resistant, and selection of the resistant strain in turf could give rise to an overall loss of efficiency of the systemics in the area where resistance appeared. Since the mode of action of all current systemics is very similar, resistance to one chemical will also likely be expressed by resistance to the others. Systemics with different modes of action will be developed in the future and will alleviate this problem of cross resistance among the systemic fungicides. Contact fungicides are active against strains resistant to systemics.

Several precautions can be used to reduce the selection pressure for resistant strains. If you must use systemics, as is the case with root-infecting fungi which cause Fusarium blight and stripe smut, reduce your use of systemic fungicides against other diseases which can be controlled with contact materials. If high rates of systemics have not been applied for control of the root-infecting fungi, it is acceptable to use them at recommended rates against foliar diseases. When used in this manner, they should not be used repeatedly, but alternately with at least two contact materials. To reduce the selection pressure for resistant strains, it is also necessary to avoid prolonged contact of the fungus with low concentrations of the systemic fungicides. This situation exists when a systemic is repeatedly applied at low rates, either alone or in a fertilizer-fungicide mixture, for control of a disease such as dollar spot. It would be preferable to use a single curative application of a systemic soon after dollar spot appears, and then use a contact material in most of the follow-up applications.

There are no confirmed instances of "resistant-*Fusarium*" on turf in New York State. Where control is less than hoped for, a reevaluation of recommended fungicide application procedures or rates, and of cultural management practices should be considered (see Nassau County Coop. Extension mimeo C-2-7, "Fusarium blight of turfgrass"). The only turf pathogen which is known with certainty to have become resistant to systemic fungicides in our state is *Sclerotinia homeocarpa*. The resistant dollar spot fungus currently appears only

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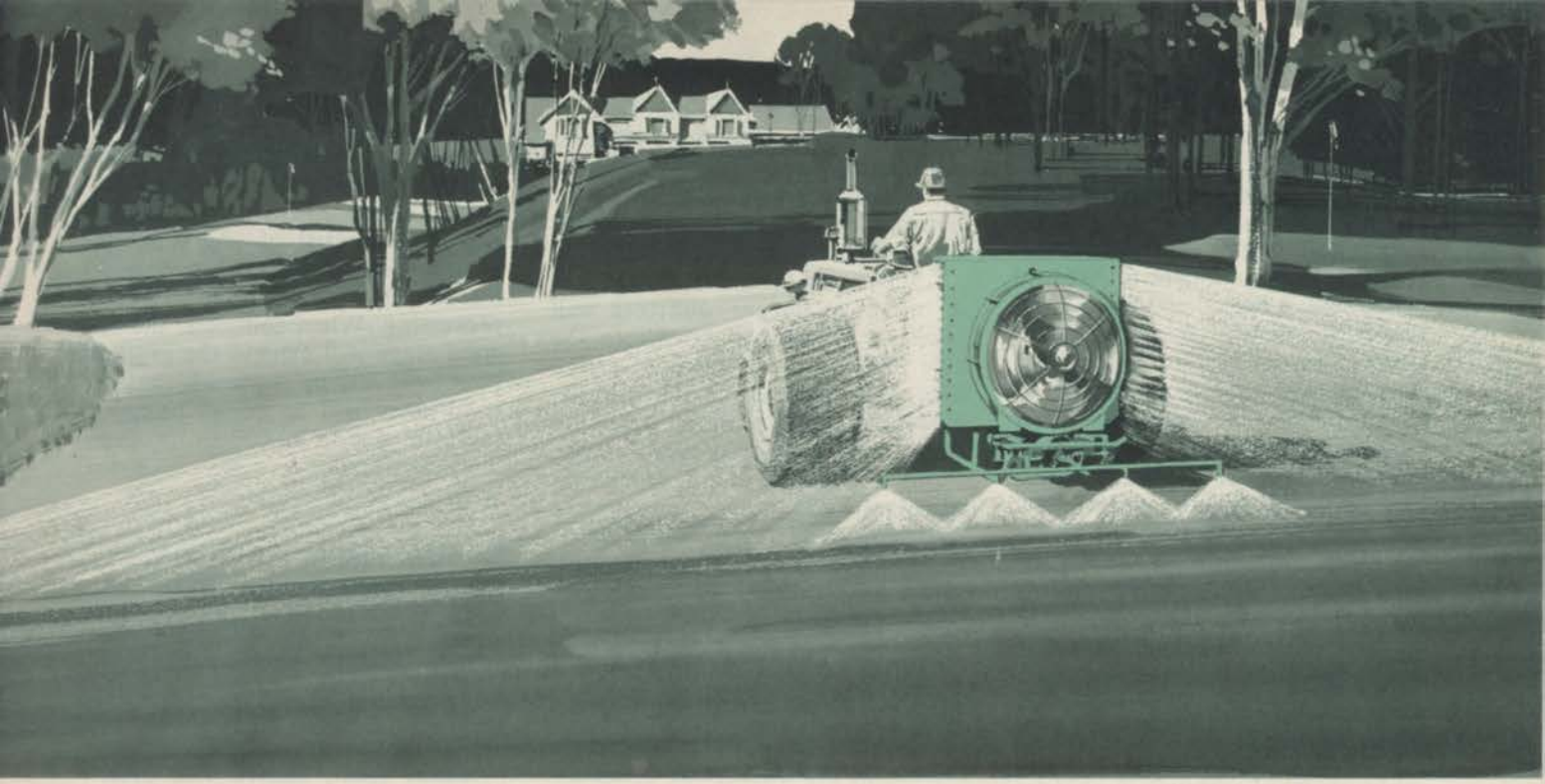

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Other Considerations

Systemic fungicides are toxic to earthworms and nematodes in soil. Earthworms are considered beneficial on most turfgrass soils, except under golf course putting greens. Reductions in numbers of harmful nematodes is considered to be a desirable side effect. Repeated foliar applications of systemic fungicides also reduces the populations of harmful mites in turf. When their populations decrease, so do the populations of predator mites which feed upon the harmful types. At a later time, the populations of predator mites can't increase until their food source (the harmful types) is supplied. In the meanwhile, the harmful mites can cause extensive damage to plants. This is possibly a factor in the observed decline of Kentucky bluegrass turf quality in the spring following repeated foliar applications of systemic fungicides during the previous summer. This tendency is thought to be much less serious or nonexistent with drench applications.

Summary

The systemic fungicides are a remarkable class of pesticides. Their attributes are many. But, as with every pesticide, certain restraints or precautions must be exercised in their use. Their efficiency is greatly reduced if they are improperly applied to soil. Since they are more selective than the older contact fungicides, more attention must be given to the diseases which are not controlled by the systemic fungicides. Repeated heavy applications can lead to phytotoxicity problems, or to an overall decline in turf quality. Pesticide programs which rely heavily upon this one class of fungicides can be expected to select strains of fungi which are resistant. In these cases, the only recourse is to shift back to contact fungicides, to resistant turf varieties, and to good cultural controls. Based upon these considerations, it seems wise to exercise caution in the use of systemics in the pesticide programs. If root-infecting fungi are not predominant in your turf, use mixed fungicidal programs for all diseases. Where high rates of systemics are used to control root-infecting fungi, it would appear desirable to avoid use of these fungicides for other diseases which are controlled very well by the contact fungicides.

Smith Turf Changes Name

Smith Turf Irrigation, Inc., of Milford, Conn., also doing business as Irrigation and Equipment Supply, has changed its name to I & E Supply, Inc., according to President Richard W. Smith.

Smith said the name change and a move to larger quarters will facilitate the firm's move into the role of a more complete irrigation and industrial supply house, specializing in sprinkler irrigation equipment, industrial pipe, valves, fittings, industrial pumps and pump packages. The move represents a change from its former role of strictly an irrigation supply house, Smith said.

Calamco and Occidental To Combine Headquarters

October ground-breaking ceremonies at the Occidental Chemical Company (Oxychem) plantsite, Lathrop, Calif., officially began construction of the combined office headquarters for California Ammonia Co. (Calamco) and Oxychem.

According to C. Martin Wilmarth, Calamco president, and James H. Lindley, vice president of Oxychem, the ever-increasing demand for nitrogen products and ammonium phosphate fertilizers has necessitated a large expansion project involving new plants, new people and additional office facilities.

The building, to be built in three stages, is planned to accommodate future expansion as well as present employee requirements. The first stage will consist of 12,400 sq. ft. and will house over 60 people in finance, credit, accounting and data processing. When complete, the second stage will expand the ground level to 16,000 sq. ft., to which a second story will be added bringing the total size to 32,000 sq. ft. over the next decade.

Central Plains Turfgrass Elects Officers for 1975

Officers who will head the Central Plains Turfgrass Foundation for the coming year are: Larry Runyon, Kansas City, Mo., reelected president; Monty Brown, Wichita, Kan., elected vice president; and Dr. Ray A. Keen, Kansas State University (KSU), Manhattan, Kan., reappointed secretary-treasurer. New directors include Richard Gray, Wichita, Kan., and Herman Siler, Springfield, Mo. Dr. Ron Campbell of KSU was reelected as a director. The officers were named during the Foundation's annual business meeting, held in conjunction with the annual KSU turfgrass conference at Manhattan, Kan., in October.

Directors of the Southern Turfgrass Association are planning for the 1975 Southern Turfgrass Conference and Show, March 2-4 at the Cook Center in Memphis, Tenn. Seated ***(left to right):*** Gene Baston, CGCS, vice president; Marion Johnson, CGCS, president; Reg Perry, executive secretary; Arlin Grant (Florida); Al Frenette (Georgia); Euel Coats (Mississippi). Standing ***(left to right):*** Jim Bridges (Tennessee); Billy Smith (Arkansas); Tommie Hill (Alabama); Kayo Mullen (Kentucky); Sam Locke (Texas); Carter Huff (Missouri).

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people on the move

Robert Orvis, promoted to works manager for FMC Corp.'s Outdoor Power Equipment Division.

* * *

J. Patrick Kaine, elected vice president of International Harvester. Kaine will continue to serve as president of IH's Agricultural Equipment Division.

* * *

Ronald S. Leafblad, appointed vice president, Outdoor Power Equipment, The Toro Company.

* * *

James A. Hunter, appointed control manager of the International Department of Hercules Incorporated. Hunter succeeds **William C. Prescott** who is retiring in early 1975.

* * *

Robert W. Brandt, named Forest Service Director of International Forestry.

* * *

Herbert A. Jespersen, named vice president of Outboard Marine Corporation and a division manager of OMC-Lincoln, a division of Outboard Marine Corp.

* * *

Dennis R. Wright, appointed to newly-created position of administrative manager, Vicon Farm Machinery, Inc.

* * *

Duane Ferrell, joined Thompson-Hayward Chemical Co. as director of New Pesticide Registrations. Ferrell will be responsible for planning and evaluating research with candidate pesticides.

* * *

Gary M. Cook, appointed senior vice president of Agrico Chemical Co.

* * *

David A. Markgraf, named director of marketing and sales, and **Jeffrey W. Raymond,** appointed sales representative in Florida and the Southeast for Applied Biochemists, Inc.

* * *

Wayne Kincannon, named a vice president of Diamond Shamrock Chemical Co.

* * *

Thomas B. Moorhead, elected vice president, administration, for Beker Industries Corp., a producer of chemical fertilizer headquartered in Greenwich, Conn.

* * *

Larry D. Liptac, appointed director of Agricultural Business Group, Velsicol Chemical Corp.

* * *

Ronald D. Ross, Jr. and **Joseph J. Maher,** promoted to senior analytical chemists in Ciba-Geigy's Agricultural Division. **Michael F. Sandine,** joined the Division as a senior experimentalist at the Boynton Beach Research Farm in Florida.

* * *

Richard E. Peltier, joined Disston, Inc. as plant manager of Disston's Danville, Va., operation.

* * *

Pipe & Plastics Group of Certain-teed Products Corp. named two marketing managers: **John E. Calkins,** asbestos cement and PVC pressure pipe, and **Alvin I. Leff,** non-pressure pipe products.

Production Costs and Seed Prices for '75

By NATE REPAIR
County Agent
Somerset County, New Jersey

WHAT YOU PAY for seed and the quantity available to you may fluctuate as much as 180 degrees. That's what we learned on a trip sponsored by Lofts Pedigreed Seed, Inc. where we went directly to the grower, and followed a pound of seed from the field through the marketing chain of sales.

We all recognize that grass seed has gone up (and sometimes down) and therefore, price fluctuations do not surprise the readers of WEEDS TREES AND TURF. What may be surprising is that inflation is *only one* of the factors that will determine the price and quantity of seed for 1975. The price you pay for lawn seed this March is probably already decided or in the final stages of being firmed up right now. Through the ever present inflation cost, a good or bad crop, equipment and other costs, the price of seed is determined. Maybe it sounds too simple but the size and quality of the crops is such an important factor in determining price that we went directly to the source to learn of their problems and their thoughts for 1975. On our trip 26 sales and management people from Lofts Pedigreed Seed, Inc. visited six states and toured fourteen seed producing operations. Here are just a few of the comments we received from the people that produce and process the great majority of your specialized grass seed varieties in the United States.

Coeur D'Alene, Idaho. Rich Lawson and Earl Crow are two of the largest grass seed producers, and both agreed that in this area of the country, climate determines price as much as any other single factor. Rolling hilly terrain prevents the use of irrigation and a dry season such as experienced in 1973 can rob a crop of up to 75% of its normal yield.

University of Idaho. Dr. Ron Ensign. Some of the finest research test plots on chemical and mechanical methods for post harvest field burning are located at the University of Idaho. After each harvest, fields are burnt-off to remove the stalks and stubble, destroy weeds and diseases, and most importantly to stimulate better growth and seed production. Where poor burns were made in 1973, the quality of the grass for seed production was very poor. Non-burning laws are now going into effect in the seed producing states which is going to make it difficult to produce seed economically. Methods are being developed for chemical burning of refuse and other methods are being tried but none are as satisfactory as burning . . . or as economical.

Pelouse Seed Co. Cleaning and Processing Plant. There's more to growing seed than planting and harvesting. One of the most up to date processing plants in the country can be seen at this location. Cleaning, screening and separating grass seed is carried on at break neck speed but the final product is practically 100% free of weed and other unwanted foreign matter.

Koth Dun Paire, Washington. Washington State Field Seed Certification Inspector, Vern Propft, showed our group through the Paire area that is just south of Spokane. In this area because of low rainfall, irrigation is a must for maximum crop yields. But the generally good climatic seasons helps to make Washington one of the finest seed producing areas, yields often ranging between 1000-1500 lbs. per acre.

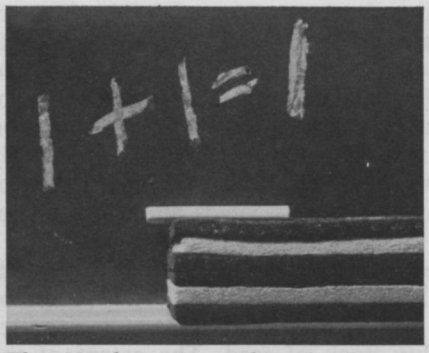
The Great Western Seed Company, Albany, Oregon, is a division of Lofts Pedigreed Seed, Inc. Assistant manager, Mr. C. M. Brownell, explained the requirements for a quality pack of seed. The extent of the equipment needed for the processing of grass seed is tremendous . . . separators, washers, screens, shakers, plus special air flow procedures are needed to assure that the end seed is pure and clean.

(continued on page 50)

The Loft's sales personnel listen attentively to one of the fourteen turfgrass seed producers as he tells them how he determines what the cost of his seed will be in 1975.

Northrup King introduces a new Kentucky Bluegrass concept:

Aquila/Parade. working as one perfect blend



The Northrup King formula for the nearly perfect Kentucky Bluegrass: 1 + 1 = 1. That's two superbly compatible bluegrasses—Aquila and Parade—working as one to create an outstanding blend component.

For a long time, turf researchers have been looking for the "perfect" Kentucky Bluegrass. They haven't found it. They've come up with some excellent varieties but not that one perfect cultivar.

Northrup King has been seeking perfection, too. And, taking a different approach, we think we've come very close to it.

Perfection, a team concept.

Since all known grasses have some sort of weakness, why not select a *team* of two grasses—with each member of the team possessing compensating strengths—and blend them in a way that's practical for use by turf professionals? This is precisely the approach Northrup King has taken.

For ten years, our researchers have sought two superior and superbly compatible Kentucky Bluegrasses to form a high-performance, low-maintenance "blend-within-a-blend". In Aquila and Parade, we've found the pair we've been after. Let's look at these two grasses, first as individuals and then as the Northrup King team of Aquila/Parade.

Aquila for persistence.

Bluegrass turf that's been established for three to five years tends to require significantly more maintenance in order to keep it dense and healthy. Aquila Kentucky Bluegrass provides a striking exception to this fact of turf life.

Once established, Aquila holds its density and color and maintains a healthy weed-resistant stand for longer than five years, even under low or moderate nitrogen fertilization. It also requires less moisture to maintain its color and shows tolerance to moderate drought conditions. It has a medium leaf width and attractive dark green color for textural and esthetic compatibility with a wide range of turfgrasses. Aquila is, on its own merits, a remarkable Kentucky Bluegrass. And we've teamed it with another:

Parade for durability.

The particular strength of Parade Kentucky Bluegrass is that it develops a tough sod fast. It withstands traffic better than many bluegrasses and can recover quickly from injury, making Parade excellent for athletic fields, golf courses, fairways and other high-traffic areas. With its pleasant dark green color and moderately broad leaf width, it's compatible with many turfgrasses. In combination with Aquila, it forms a nearly perfect blend component.

Aquila/Parade: low maintenance, high performance.

Together, Aquila and Parade give you a bluegrass component with more advantages than any single cultivar we've ever seen or heard about.

The Aquila/Parade team requires moderate amounts of fertilization, water and general care—factors that should help your maintenance budget considerably. Yet, in concert with other grasses that meet your requirements, Aquila/Parade will provide a uniformly attractive turf that establishes early and lasts straight through into fall. This blend component will also stand up well under traffic and give you good disease protection.

Aquila/Parade is ready. Now how do you use it?

Northrup King is committed to the blend concept, as are many turf experts today. Our experience convinces us that a good com-

Two bluegrasses to form a nearly component.

bination of grasses will give the best performance. So we look upon Aquila/Parade as a component to be blended with rye, fescues, other bluegrasses and/or whatever your particular conditions warrant. And, we'll gladly help you formulate the proper blend.

If you'll fill out the form below, we'll give you our professional recommendation as to the best blend, using Aquila/Parade as a component. We hope you'll take us up on this offer, because we think the Aquila/Parade team is the most important Kentucky Bluegrass concept to date—as close to perfection as anybody's been able to get.

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KENTUCKY BLUEGRASSES

Northrup King will recommend a blend, using Aquila/Parade, customized to your specific needs.

Just fill out this form and send it to Aquila/Parade, Northrup King & Co., 1500 Jackson St. N.E., Minneapolis, MN 55413.

Name:_____ Title:_____

Club or Company:_____ Phone No.:_____

Address:_____ City:_____ State:_____ Zip:_____

For: ☐ New turf ☐ Interseeding established turf ☐ Renovating old turf

Use: ☐ Prestige turf ☐ Utility turf ☐ Athletic or heavily used turf ☐ Background turf

☐ Other_____

Area to be seeded:_____ Approximate planting date:_____

Soil type: ☐ Sandy ☐ Loamy ☐ Clay ☐ Peat Soil condition: ☐ Droughty ☐ OK ☐ Wet

Fertility Level:_____ ☐ pH ☐ Acid ☐ Neutral ☐ Alkaline

Topography: ☐ Steep ☐ Rolling ☐ Level Light: ☐ Sunny ☐ Partial shade ☐ Heavy shade

Disease and insect problems encountered:_____

Intended management: ☐ Intensive ☐ Moderate ☐ Low

☐ Irrigated ☐ Non-irrigated

Mowing height:_____ Frequency:_____

Fertilizer program:_____

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MOTIVATING the TURNED-OFF EMPLOYEE

PART II

By DR. JOHN L. McKEEVER
Colorado State University
Ft. Collins, Colorado

Editor's Note: This is the second of a series of employee management articles written by Dr. McKeever. Part one, which appeared in the December 1974 issue, dealt with the basic need structure of man. In part two the author continues his discussion of needs and introduces goal achievement as a means of satisfying these needs.

PERSONAL GOALS in the organizational environment have value in that they give continuity, consistency and direction to employees. Yet goals are not the end in human behavior — they are the means to the end. Goals have additional meaning and purpose in that their achievement will result in the satisfaction of a need. To understand the behavior of humans we must comprehend the goal/need structure. When we achieve a goal, it will result in the satisfaction of a need.

Physiological Needs

Individually and collectively we have the same needs, but we may establish and strive for different goals to achieve them. Wherever man exists throughout the world he has the same set of needs, but he may put different stress upon them. All humans have a physiological need that must be satisfied if they are to survive in their environment. The physiological need is man's biological need, sometimes referred to as his physical or basic need. This need is reflected by man's urges or drives of a biological nature that must be satisfied in some form or another.

Physiological need is exemplified by hunger, thirst, clothing, shelter, rest, air and sex. At least the first four are satisfied primarily by money. Unless we grow our own food, weave our own clothing and build our own homes, we are dependent upon others to acquire satisfaction of this need. Most of us would never survive if suddenly we had to become self-sufficient. We have been trained to be specialists in our professions and are dependent upon other specialists to provide our physiological need satisfaction for food, shelter and clothing.

In this society, to acquire money necessary to satisfy our physiological needs we have many alternatives available to us. Generally we work for salaries or wages and invest our capital, time and effort to make a profit. Some invest their wealth in stocks, bonds or real estate for dividends, interest or rents. Some steal or print it while others may marry it. No matter what alternative you choose, it requires both personal and social effort to satisfy the physiological need, or certain aspects of it, better than others. When the physiological need is not being satisfied, the individual may not survive. Our physical and social environments put a high premium on individual survival. Throughout the world, physiological need satisfaction is a major problem as pestilence, famine and disease are facts of life each and every waking day to a substantial segment of human life.

Safety Need

Man has another need whigh is really an extension of his physiological need and it is called the safety need. This is man's need to prevent any threat of deprivation of his physiological need. Since most of us are dependent upon salaries, wages or profits during our productive lives to satisfy the economic aspects of the physiological need, we are constantly aware of the fact that an unfortunate event could deprive us of the money needed to satisfy our needs.

Most of us know that a serious illness or accident may not only eliminate or reduce our wage or salary, but if special medical attention is needed it could use up our savings and leave us in debt. Also, we know that we may be forced into unemployment by lay-off or dismissal from our jobs. Furthermore, when we retire, our physiological needs go on, hence the continuing need for money or financial support in some form or another.

We satisfy the safety need by buying a multitude of insurance policies on our lives, homes, automobiles and household furnishings to protect ourselves and others. We try to put aside savings for retirement or to carry us through an emergency period in which our salaries or wages are reduced or eliminated. The government encourages but does not underwrite our safety need entirely through social security, unemployment compensation or workmans compensation. In trying to prevent any deprivation of our physiological need resulting from adversity, we deprive ourselves of many current benefits and enjoyments in anticipation of a contingency which may or may not happen.

In management, the physiological and safety needs combined are referred to as the economic needs of man as money is the basis for their satisfaction. In our society it takes money to buy food, land, homes, clothing, clean water, and the insurance policies, annuities and investments that are so necessary to physiological survival. Because this money need is so easily identifiable and its importance recognized and tested, great emphasis is placed on it as the major motivator of employees. Both management and union leadership over-emphasize the importance of salaries, wages and fringe benefits as the major factor in

(continued)

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MOTIVATING the TURNED-OFF EMPLOYEE

controlling and utilizing the human element in the organization.

Unfortunately the understanding of human nature in the organizational environment is not as simple as managers would make it by over-stressing the importance of money. Each individual in the organization has needs that must be satisfied in the work environment that money alone will not achieve. Management frequently assumes that to hire an employee, to get him in there, to train him and to get him to do some work, all you have to do is pay him a salary and give him some fringe benefits. But man is *not* just an economic animal, nor is he just a biological animal.

Social Need

Into the work environment, each employee, whether manager or non-manager, takes his social need — the need to socialize with his fellow man, to be wanted, to be a part of the social environment. In many shops, offices, factories and plants, management discourages socializing between employees either by isolating them spatially or by policy rules which, if violated, may result in disciplinary action. The coffee break is usually the only overt act of management to provide for social need satisfaction in which the employee can socialize with his fellow man without suffering feelings of guilt. Not only is it impossible for employees to restrict their socializing to 10 or 15 minutes during the coffee breaks, it is unnatural for employees to behave in such a manner. Consequently, employees satisfy their social needs by performing an astonishing number of games that overtly or covertly violate management policies relating to socializing on the job. In fact, I have observed some of the most creative performances in an organization by employees satisfying their social needs. Employees cared little that it violated organizational rules or policies and made them vulnerable to disciplinary action.

In addition to physiological, safety and social needs, employees have a psychological need that must also be satisfied in the work environment. This need will be referred to as the ego need of man, and is composed of two parts. One part is introspective as man looks inwardly to acquire a feeling of selfesteem, pride or inner-satisfaction. Unless the employee can feel pride for the firm he works for or the job he does, he may be demotivated.

The other part is extrospective in nature and is concerned with the way that a person wants others to view him. This is the reputation of the employee in the community of man. To satisfy this need we do many things to establish a reputation including the acquisition of status symbols. Sometimes the reputation we hope to achieve in the eyes of others is not the same as they may view us. It is not unusual for people to formulate opinions of others — individually or collectively — that may be erroneous. Yet whether good, bad or indifferent we all formulate opinions and ideas about the reputations and personalities of others with whom we interact. Success — financial or otherwise — in the organization is often dependent upon the reputation that we establish. How others view us is important to our future in the organization.

To enhance our reputations, we strive to acquire the symbols of status that are provided at various levels of management. In most organizations you can identify the status of each management level by such symbols as reserved parking spaces, titles, size of offices, placement of offices (number of windows often is an important factor along with floor location), rugs on the floor, a secretary or number of secretaries and composition of office furniture (metal, mahogany, and so on), to name a few. Status symbols serve as goals to the aspiring manager and their achievement satisfies both aspects of the ego need.

Probably no other need is more negatively affected in the organization than the ego need. By not giving compliments for a job well done, or by treating mature employees as children, or by not being fair, equitable and honest with employees, the ego need of organization people is easily dissatisfied and bruised.

Self-Actualization Need

Finally, man has a creative need, sometimes referred to as a self-actualization need. Basically this need reflects man's desire to be creative ranging from doing best whatever it is that he is doing in the organization to performing in a highly creative or innovative manner. This need of people is affected by many factors including the formal training that a person receives in the organization that may contribute to his creative ability or it may relate to the type of monotonous, routinized and proceduralized work that management requires people to perform in the work environment. Every employee in the organization has a creative need to be satisfied and the extent to which he satisfies this need is substantially dependent upon how well management creates an environment that is conducive to opportunity challenging work, and provides training to add breadth and depth to the objectives of employees. Management can create a work environment that motivates employees to creative effort. The alternatives to a highly innovative environment can be one that is devoid of challenge, competition and recognition.

These are the needs of man and are the same wherever you find him. He may stress the five needs differently, but they are all present and demand satisfaction. It is in the needs of man that we find an explanation for human behavior.

When employees — managers or non-managers, male or female, skilled or unskilled — accept jobs or positions in an organization it is not enough that management ask for a "fair day's work for a fair day's pay." To put man into such a simplified formula of exacting a unit of energy in production or service for a dollar is to relegate him to a role he is unable to play. Man is infinitely more complicated than a piece of machinery to be turned on or off by a paycheck and a few fringe benefits.

Employees have needs of a non-monetary nature that must be satisfied, at least partially, in the organization environment. Man will seek to satisfy his non-monetary, social, ego and creative needs in the work environment in his own way if management does not provide for them. If management does not understand the things that motivate the employee to behave as he does in that environment, then conflict will probably result. Management should attempt to provide objectives, direction and guidance to employees as they strive to satisfy non-monetary needs. If management emphasizes the economic man con-

cept, then certainly the physical efforts, imagination and creativeness of the employee will be directed toward non-productive work effort. The creative effort of employees in acquiring satisfaction of a non-monetary, non-productive nature is beyond the comprehension of management. The effort of an individual employee in seeking need satisfactions of a social, ego and creative nature in a work environment that does not provide for it, let alone recognize it, generally is counter-productive. When a number of employees join efforts to achieve non-monetary need satisfaction that is not provided in the work environment, the counter-productive nature may become increased to the point of a fraction of the fullest work potential of the group.

In the work environment, management should evaluate its philosophies and attitudes toward employees in terms of how they affect the work climate. Management should establish a work environment that is conductive to opportunity, fairness, honesty, respect and dignity.

Root Growth, Finer Color By Drill Hole Fertilizing

Trees require certain food elements to sustain life. Carbon dioxide is taken from the air above and below ground. Soil water supplies hydrogen, oxygen, nitrogen, phosphorous and other chemical elements. Many of these trace elements are essential and must be replaced if a shortage develops in natural food-producing methods.

One of the most effective methods of food replenishment, say the Davey Tree people of Kent, Ohio, is by the drill hole technique. Through the use of an electric drill or punch bar, holes approximately a yard apart are drilled to a depth of 12 to 24-inches over the entire root system. Beginning at the edge of the branch spread of the tree, placing a high nitrogen tree food in the holes, then filling with loose soil or peat moss.

No other form of tree care brings about such improvement as that provided by fertilizing. The resulting increased root growth stimulates luxuriant foliage and finer color. Such feeding is particularly recommended in areas where poor soil conditions (clay soil) or insect problems exist.

A two-man crew drills and fills the holes beneath the branch spread of a tree.

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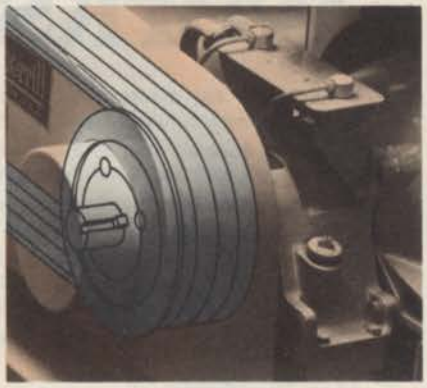

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Superintendents Open Show Feb. 16-21

THE Golf Course Superintendents Association of America's (GCSAA) 46th annual International Turfgrass Conference and Show will officially open the doors to one of the largest educational conferences and equipment displays in the golf profession February 16, 1975.

The show will offer superintendents, club officials, golf professionals and others interested in the golf turf management an inside view of new developments through a combination of educational assemblies and an industrial exhibition.

Although the annual activities of this golf turf management profession will actually begin February 13 in Pensacola, Florida, with the GCSAA Championship Golf Tournament, followed by Pre-Conference seminars on pesticide usage and financial mangement in New Orleans, February 15 and 16, the Conference will officially begin Sunday, February 16 and run through Friday, February 21.

Chris Schenkel, ABC-TV Sports commentator, will give the keynote address Monday, February 17 in the North Hall of The Rivergate, being followed by over 50 speakers during the week who will discuss a wide variety of subjects in concurrent general and special interest sessions.

A ribbon cutting ceremony at 9 AM, Tuesday, February 18, will open the GCSAA Turfgrass Industry Show. Nearly 100,000 square feet of The Rivergate will be filled by approximately 160 different firms who will introduce new items to their product lines and be on hand to answer technical questions. The Show continues through 4 PM, Thursday, February 20.

Demonstrating the diversity of interests present among golf course superintendents, the educational program will include presentations on topics such as government relations with OSHA and EPA, the general manager concept and turf management, as well as landscaping, personal finance, people relations, communications and facilities management.

Friday, February 21 will be highlighted by a tour of the Lakewood Country Club, Timberlane Country Club and New Orleans Country Club, where a close look will be taken at Southern golf course operations.

Among the social activities planned for the conference are a Mississippi River cruise Monday night and the annual banquet and dance Thursday night. Anna Maria Alberghetti will headline the entertainment at the banquet, with the Rene Louapre Orchestra, official Mardi Gras orchestra, providing dance music later in the evening.

Registration fees for the week-long Conference and Show range from $15 for GCSAA members and ladies to $35 for non-members. Tickets to the social functions will cost $6 for the river cruise and $10 for the banquet and dance. Non-registered individuals may purchase daily exhibit show passes for $5 each. Golf Course Tour tickets will cost $5 each.

Descriptive brochures and registration materials may be obtained by contacting the GCSAA Headquarters, 1617 St. Andrews Drive, Lawrence, Kansas 66044, or telephoning (913) 841-2240.

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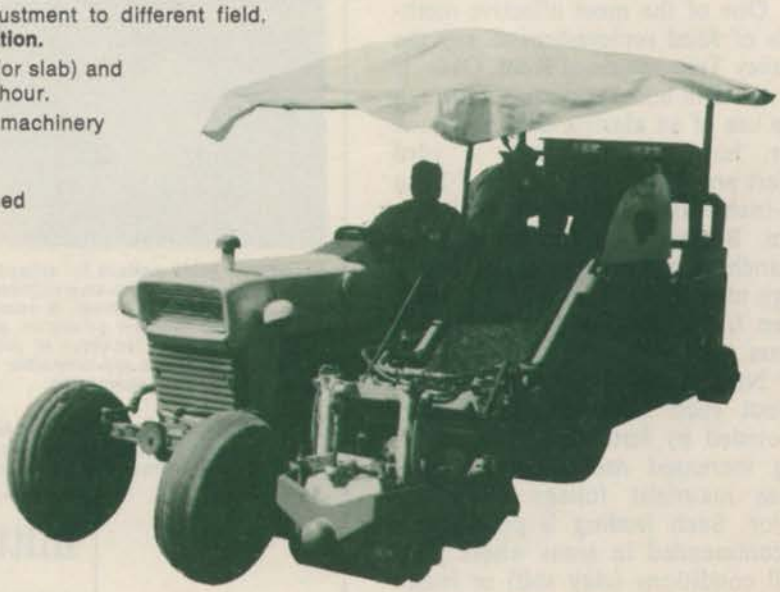

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Phone 502/459-3811

ALCA *(from page 25)*

Everett Williams of Ford Tractor Operations, Caterpillar's Nick Humey and Bob King of International Harvester.

Environmentalists will also be represented during the meeting. Dr. Reuben Zubrow, professor of economics, University of Colorado, will speak on "The Crud Factor." The Florida Chapter of the Sierra Club will present its side in the continuing ecology problems of the host state. John Holm, a contractor from Fairbanks, Alaska, will describe some of the ways the Alaskan pipeline is affecting ecology in that state.

Many major equipment manufacturers will be at the ALCA Trade Exhibit, as well as producers of other products and services used by landscape contractors.

ALCA will present Environmental Improvement awards for the fifth year. These awards will be given to projects throughout the U.S. For the first time, awards will be presented in Maintenance and Erosion Control categories.

The program will also feature specialty sessions, allowing contractors to meet with each other to discuss their individual specialties, including irrigation, maintenance, erosion control, design/build and interior landscaping. Each group will be led by a landscape contractor who is known for his specialty.

For more information, including registration and hotel forms, write: Associated Landscape Contractors of America, 1750 Old Meadow Road, McLean, Va. 22101.

SEED *(from page 41)*

Turf Seed, Inc., Hubbard, Oregon. Mr. Dick Bailey is a seed grower and also producer of improved ryegrasses and fescues. On our visit Dick was sprigging bentgrass.

Chuck Curtis Farm. This farmer is one of the primary producers of Kingstown Velvet Bentgrass. Land preparation is one of this farm's major expenses. Test plots at the Curtis farm are maintained by Great Western Seed Company and show the remarkable differences in disease resistance within varieties of bluegrass, fescues and ryegrasses.

Mr. Paul Pugh, Oregon. Several innovations on farm equipment are incorporated on this farm. One such improvement is putting a ceramic covering on the fertilizer spinning wheels to reduce chemical corrosion and wear. Still another is a second cleaning and screening chamber on combines plus balloon-type tires for the wet harvest season.

Glen Smith Farm in Oregon. One of the finest producers of Baron Kentucky Bluegrass in the country. Mr. Smith expects yields of 1500 lbs. per acre and pointed out that this year his fields are about 100% weed free.

Mr. Clarence Vennel's Farm, Corvallis, Oregon. A 12,000-acre seed farm plus ten new combines, an air strip and modern seed processing plant is a most impressive sight indeed. Here seed is grown, processed and packaged all in one location.

Certainly, the lawn seed producer has his own brand of obstacles and on our trip we found that we can be proud that our U. S. seed producers are over-coming each problem with great ingenuity. With this ingenuity (and some help from decreasing inflation) seed prices in 1975 will be as low as possible.

How to stop diseases, kill weeds and make your job easier... all with one company... W.A.Cleary

Fungicides

3336 Turf Fungicide A broad spectrum systemic fungicide that prevents and controls all 6 major turf diseases. Non-toxic, non-mercurial.

Bromosan The newest broad spectrum systemic fungicide for those persistent problem areas or areas that have gotten out of hand.

Cleary's Granular Turf Fungicide A granular—spreadable broad spectrum containing Thiram and Cadmium Chloride. Excellent for SNOWMOLD and for Spring and Summer diseases.

Caddy A broad spectrum fungicide that prevents and controls all 6 major turf diseases. Non-toxic, non-mercurial.

Spotrete 75% Thiram Fungicide can be mixed with PMAS or CADDY. Controls brown patch, dollar spot and snowmold.

Cad-Trete A broad spectrum fungicide containing Thiram and Cadmium.

PMAS (10%) A dual purpose herbicide/fungicide. Safe for the finest turf.

Herbicides

MCPP For selective control of chickweed, knotweed and clover on Bentgrass greens and fairways, Bluegrass and Fescues.

MCPP Plus 2,4-D Controls chickweed, knotweed, dock, dandelion, plantain, ragweed, purslane, pigweed, etc.

Methar 80 An extra high concentrate of Disodium Methane Arsonate Hexahydrate to control Dallisgrass and crabgrass. Completely water soluble.

Methar 30 A high concentrate liquid equivalent to 30% Disodium Methane Arsonate Hexahydrate. A super crabgrass killer.

AMA Plus 2,4-D For the control of Dallisgrass, Silver Crabgrass, plantain, dandelion, knotweed, chickweed and other broadleaf weeds.

AMA (Super Methar) Amine Methylarsonate, liquid for Crabgrass and Dallisgrass control.

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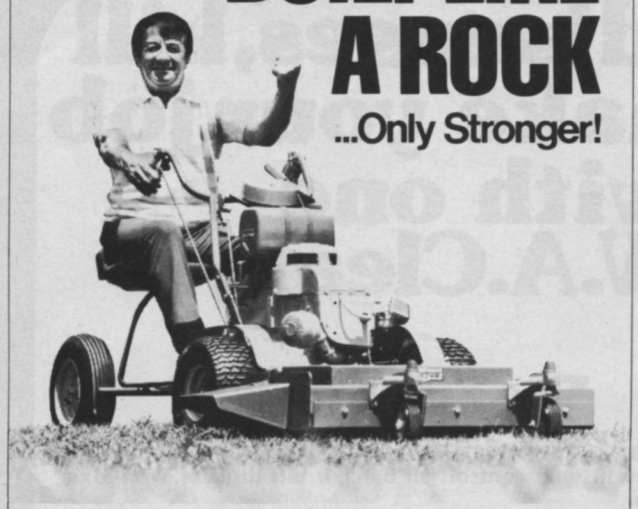

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meeting dates

Tidewater Virginia Nurserymen's Short Course, Norfolk, Va., Jan. 15-16.

Maine Nurserymen's Assn., annual winter convention, Augusta Civic Center, Augusta, Maine, Jan. 16.

Virginia Eastern Shore Nurserymen's Short Course, Painter, Va., Jan. 16-17.

Washington State Nurserymen's Assn., winter convention, The Inn at the Quay, Vancouver, Wash., Jan. 16-17.

Mid-Atlantic Nurserymen's Trade Show, Greenbrier Hotel, White Sulphur Springs, W. Va., Jan. 19-21.

South Carolina Nurserymen's Short Course, Clemson House, Clemson, S.C., Jan. 19-21.

New York State Arborist Assn., convention, Syracuse Hilton Inn, Syracuse, N.Y., Jan. 19-22.

27th Annual California Weed Conference, Sheraton Inn, Fresno, Calif., Jan. 20-22.

Landscape Ontario, annual congress, Four Seasons-Sheraton Hotel, Toronto, Ont., Jan. 20-22.

1975 Arborist Seminar, Illinois Commercial Arborists and Cook Co. Extension, Sheraton-O'Hare, Rosemont, Ill., Jan. 21.

New Jersey Recreation and Park Assn., 9th annual symposium, Labor Education Center, New Brunswick Campus, Rutgers Univ., New Brunswick, N.J., Jan. 21.

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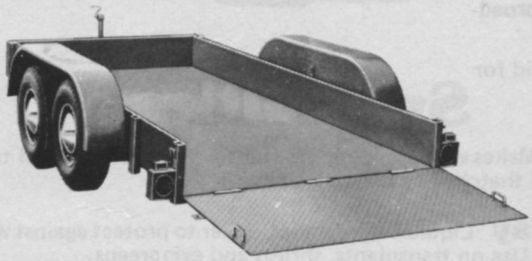

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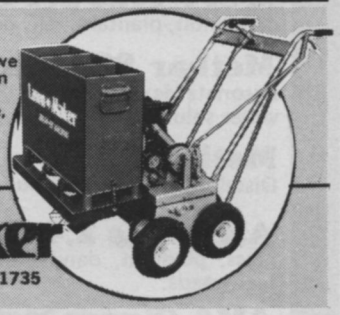

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Southern Weed Science Society, 18th annual meeting, Southern-Peabody Hotel, Memphis, Tenn., Jan. 21-23.

Connecticut Nurserymen's Assn., 23red annual nurserymen's short course, Northeast Utilities Auditorium, Berlin, Conn., Jan. 22-23.

Kentucky Nurserymen's Assn., annual meeting, Stouffer's Louisville Inn, Louisville, Ky., Jan. 22-23.

13th Annual Nebraska Turfgrass Conference, Nebraska Center for Continuing Education, Lincoln, Neb., Jan. 22-24.

Georgia Nurserymen's Short Course, New Holiday Inn, Athens, Ga., Jan. 23-24.

Roanoke Virginia Nurserymen's Short Course, Roanoke, Va., Jan. 23-24.

Rocky Mountain Regional Turfgrass Conference, Colorado State Univ., Fort Collins, Colo., Jan. 23-24.

Tennessee Nurserymen's Annual Short Course, Plant Science Building, Univ. of Tennessee, Knoxville, Tenn., Jan. 23-24.

New Jersey Assn. of Nurserymen, annual meeting, Sheraton Poste Inn, Cherry Hill, N.J., Jan. 23-24.

Ohio Chapter, ISTC, 33rd annual meeting, Sheraton-Columbus Hotel, Columbus, Ohio, Jan. 26-28.

46th Annual Ohio State Univ. Short Course for arborists, turf managers, nurserymen, garden center operators and landscapers, Sheraton-Columbus Hotel, Columbus, Ohio, Jan. 26-30.

Southwest Virginia Nurserymen's Short Course, Abingdon, Va., Jan. 27.

Associated Landscape Contractors of America, Inc., 13th annual meeting and trade exhibit, Hilton On-the-Bay, St. Petersburg, Fla., Jan. 27-31.

Turf Management Short Course, Nashville Center of the Univ. of Tennessee, Nashville, Tenn., Jan. 27-31.

11th Annual Northern California Turfgrass and Environmental Landscape Exposition, San Mateo Co. Fairgrounds, San Mateo, Calif., Jan. 29-30.

Reinders Brothers Turf Equipment, 2nd turf conference, equipment show and service clinic, Elm Grove, Wis., Jan. 29-30.

Virginia Turfgrass Conference, Sheraton Motor Inn, Fredericksburg, Va., Jan. 29-30.

1975 California Plant and Soil Conference, Sheraton Inn, Anaheim, Calif., Jan. 29-31.

Pennsylvania Nurserymen and Allied Industry Conference, University Park Campus of Penn State Univ., University Park, Pa., Feb. 4-6.

Weed Science Society of America, annual meeting, Statler-Hilton Hotel, Washington, D.C., Feb. 4-7.

Environmental Horticulture Conference, sponsored by Univ. of California's Cooperative Extension and 11 professional associations, San Jose, Calif., Feb. 5.

Annual Turf and Landscape Conference, N.Y. Turf and Landscape Assn. and the Long Island Gardeners Assn., Tappan Zee Inn, Nyack, N.Y., Feb. 5.

CONEXPO '75, construction equipment exposition and road show, McCormick Place and International Amphitheatre, Chicago, Ill., Feb. 9-14.

Midwestern Chapter, ISTC, annual meeting, Plaza Inn, Kansas City, Mo., Feb. 11-13.

American Institute of Landscape Architects, convention, Marriott Inn, New Orleans, La., Feb. 13-15.

American Society of Consulting Arborists, 8th annual conference, Don CeSar Hotel, St. Petersburg, Fla., Feb. 13-15.

National Arborist Assn., annual winter meeting, Don CeSar Hotel, St. Petersburg, Fla., Feb. 16-20.

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In 10 years of man-controlled parentage breeding and over 7 years of university and field testing, "Adelphi" has earned a top rating for overall performance.

"Adelphi" offers the features most wanted in turf. Professionals and home gardeners, alike, are making it the most widely accepted and universally acclaimed bluegrass in 30 years.

For good looks throughout the entire growing season ...excellent density...good disease resistance and tolerance to moderately close mowing, it's...MAN-MADE "Adelphi"...A FIRST IN TURF!

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CHALLENGE *(from page 10)*

We hydro-seeded the course to control erosion, to help get a fast turf cover, and because it does a better job inside bunker lips that are difficult to seed with a drill. Fairways were seeded with a mixture of Baron, Fylking and Park bluegrasses plus Manhattan ryegrass. We planted Penncross on the greens and Exeter Colonial bentgrass on tee-boxes. However, I also seeded several championship tees to Zoysia and am pleased with the result.

We also hydro-seeded the inside of traps. When we returned later to clean our traps, we cut the sod out and placed it along slopes that had been washed out by rain runoff. Thus, the sandtraps served as "mini-sodfarms" while saving labor.

We top-dressed the greens with our sand and peat moss mixture to avoid a layered effect. We used small layers of top-dressing and dragged them in with a Ryan dragmat. As grass emerged, we fertilized the greens with 20-0-16 greens fertilizer and then top-dressed them again. While top-dressing, we cut the greens at 5/16 inch and gradually lowered the height to 3/16 inches before opening the course.

A Caterpillar tractor clears away rock as workers sculpt the Jones-designed golf course out of 100 acres of shale and flint rock along the shore of Lake of the Ozarks.

We seeded in October and early November. Seeding in late fall was a gamble, but it paid off because we had a mild winter and very wet spring. In order to have the course playable for a tournament last May, we used a single-engine airplane to lightly fertilize the course in early March with 30-3-10 to foster rapid growth.

The airplane was necessary because 15 of our fairways had filter six inches deep and had not had time to set. Thus, the course was too soft to be fertilized by ground. We fertilized the fairways again in late April by ground with 19-5-7.

Selecting grass varieties was no simple task, because our course is in the Transition Zone where even individual slopes have their own "micro-climates." We put down five grass varieties with the hope that some of them would take to the soil with extra water, lime and fertilizer. Late this summer we overseeded our fairways with Baron with good results. Zoysia also has fared well and we are thinking about converting to it on fairways next year instead of bluegrass. Zoysia is inexpensive to maintain because it requires less fertilizer, is drought re-

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sistant and grows so slowly it needs less mowing.

Another problem we experienced was acquiring sand to fill traps. The nearest suitable sand was 50 miles away along the Missouri River near Jefferson City, Mo. It took four months to complete trap construction and we hauled in 3,000-cubic yards of sand from the river. We used a small skid-loader to clean out the traps. By working an entire trap out from the inside, we avoided any damage to the fairways.

Because our course is bisected by a paved roadway (Missouri-HH), we had to construct a $35,000 tunnel under it for safe access to the 12th, 13th and 14th holes by our Cushman golf car fleet. The first step was to develop a detour. Then we build part of the 8 x 10-foot reinforced concrete tunnel before repaving the highway.

Building the course was a challenge, but Koplar Enterprises backed me with the best materials, equipment and personnel available to do the job. The course fulfilled a long-time dream by Harold Koplar, especially since Jones has termed it one of the best courses he has ever designed.

Gary Grigg, course superintendent at All Seasons Country Club golf course, checks on construction of a $35,000 tunnel under a roadway bi-secting the course.

Product Removes Thatch

A new material — called bio de-thatch — made up with micro-organisms and designed to eliminate thatch is now on the market.

It has been patented by Bio De-thatch of Louisville, Ky., and is being distributed by USS Agri-Chemicals. The product is immediately available. It has been and continues to be tested by a number of commercial and university groups.

President Julian Fortney heads the Bio-Dethatch enterprise and is working closely with USS Agri-Chemicals in getting the product introduced to the market. The marketing plans for this involve the entire USS Agri-Chemical distributor network.

Bio de-thatch is a dry-granular material that has been saturated with micro-organisms dried, pelleted, and crumbled which puts the micro-organisms into a dormant condition. When it is applied to the turf and is washed down to the soil surface or thatch build-up area it activates and feeds only on all forms of dead plant matter (plant residue) and digests the plant residue into humus (mulch) in the soil. Thatch is the accumulation of dead leaves, stems, clippings etc., that builds up between the soil surface and the green vegetation. It can be determined as to depth only by cutting a pie-shaped wedge or using a soil probe and measuring.

Morning dew is sufficient moisture to activate the micro-organisms in bio de-thatch and when activated the direct rays of the sun will deteriorate them so the watering is needed more to wash the material out of the sunlight than to activate the micro-organisms. However, during hot dry weather it is best to keep a good moisture level for approximately the first 48 hours after application because the material may dry out before it can fully activate. Once the thatch build-up area (referred to above) has been reduced sufficiently, the dry dead grass in the lawn will fall into the area where the thatch has been digested, and bio-degrade.

Best time to apply bio de-thatch is when the ground temperature is above 40° provided it is washed down to the soil surface when applied. The best time to apply is early in the spring or early in the fall because the moisture and temperature levels are the most favorable for good digestion in the shortest possible time. Bio de-thatch

Leon Short bags it!

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like mold growing across a slice of bread is continuously growing and feeding on dead plant tissue in all levels of the soil profile. As it digests and converts the residue to mulch in the soil in one area, it then grows to another. Because of this, once fully activated (about 72 hours), the micro-organisms will grow in a warmer more moist area when the soil gets too cold or too dry close to the surface. Too much heat is not a problem. When the temperature is too low or the soil too dry the organisms go dormant and then will reactivate when the soil environment returns to a condition where they can again be active.

When bio de-thatch has overcome the thatch build-up, it is able to keep it under control at all times when an application is made once each year. It is applied at a rate of one pound per 1,000 square feet with a cyclone spreader. (For further information, circle (709) on the reply card.

BlueBird Names Distributor

BlueBird International, Englewood, Colo., manufacturer of BlueBird lawn combers, lifts and engine stands, announced the appointment of American Garden Western (formerly Western Seed) as distributor in Colorado and parts of Wyoming.

Doug Zehrung, BlueBird president, said that American Garden Western, headquartered in Denver, will market BlueBird lawn combers to all merchandisers of turf care equipment in its area, including lawn and garden stores, nurseries, professional turf care firms and hardware stores. American Garden Western is a subsidiary of American Garden Products Co. of Boston, Mass.

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Turf, Ornamentals Session Highlighted at Conference

A session on ornamentals and turf will highlight the first day of the 1975 California Plant and Soil Conference, to be held at the Sheraton Inn, Anaheim, Calif., Jan. 29-31.

Lee Hermsmeier, USDA, will open the program with a discussion of his research on common lawn sprinkler performance. Dennis McLain, Hines Wholesale Nurseries, will outline irrigation practices used in the production of containerized nursery stock. His discussion will include techniques for injecting chemicals into the irrigation system. Dr. John Radewald, UC Riverside, will speak on nematodes and their effects on turfgrasses. Dick Maire, Los Angeles Co. Farm Advisor, will discuss a new technique for establishment of Monterey Pine from cuttings. Dr. Victor B. Youngner, UC Riverside, will present information on the effects of air pollution on turfgrasses. Dr. Scott Arnold, O. M. Scott Company, will give an overall view on what is presently known about Kentucky bluegrass problems caused by the disease Fusarium Roseum.

Leisur-AID Moves to Iowa

Leisur-AID, the lawn and garden distributing division of Aidex Corporation, has moved to its new headquarters in Council Bluffs, Iowa. The new facilities, consisting of five buildings on a 21-acre site, will consolidate various formulating, packaging and distribution entities of Aidex Corp.

Leisur-AID now has four dealer consultants calling on lawn and garden dealers and golf courses in Iowa, Nebraska and portions of surrounding states. A complete line of products for the dealer and chemicals for the golf course and grower are carried, according to a Leisur-AID spokesman.

Forest Service Directors Located at Field Stations

Three of five assistant directors for Forest Service research in the northeast are now stationed at field locations, closer to the programs they administer, the problems they must solve and the people they serve.

Under the old system, all five were located at Northeastern Forest Experiment Station headquarters in Upper Darby, Pa. The new organization gives each man jurisdiction over a specific geographic region. In addition, the Station has created a new position of deputy director. The changes were announced by Station Director F. Bryan Clark. The new arrangement will hopefully help Forest Service research to "be more effective in responding to the needs of forest users," said Clark.

R. Duane Lloyd has been named the first deputy director. Lloyd was director of Forest Recreation and Related Human Environment Research in Washington, D.C. before his move to Upper Darby.

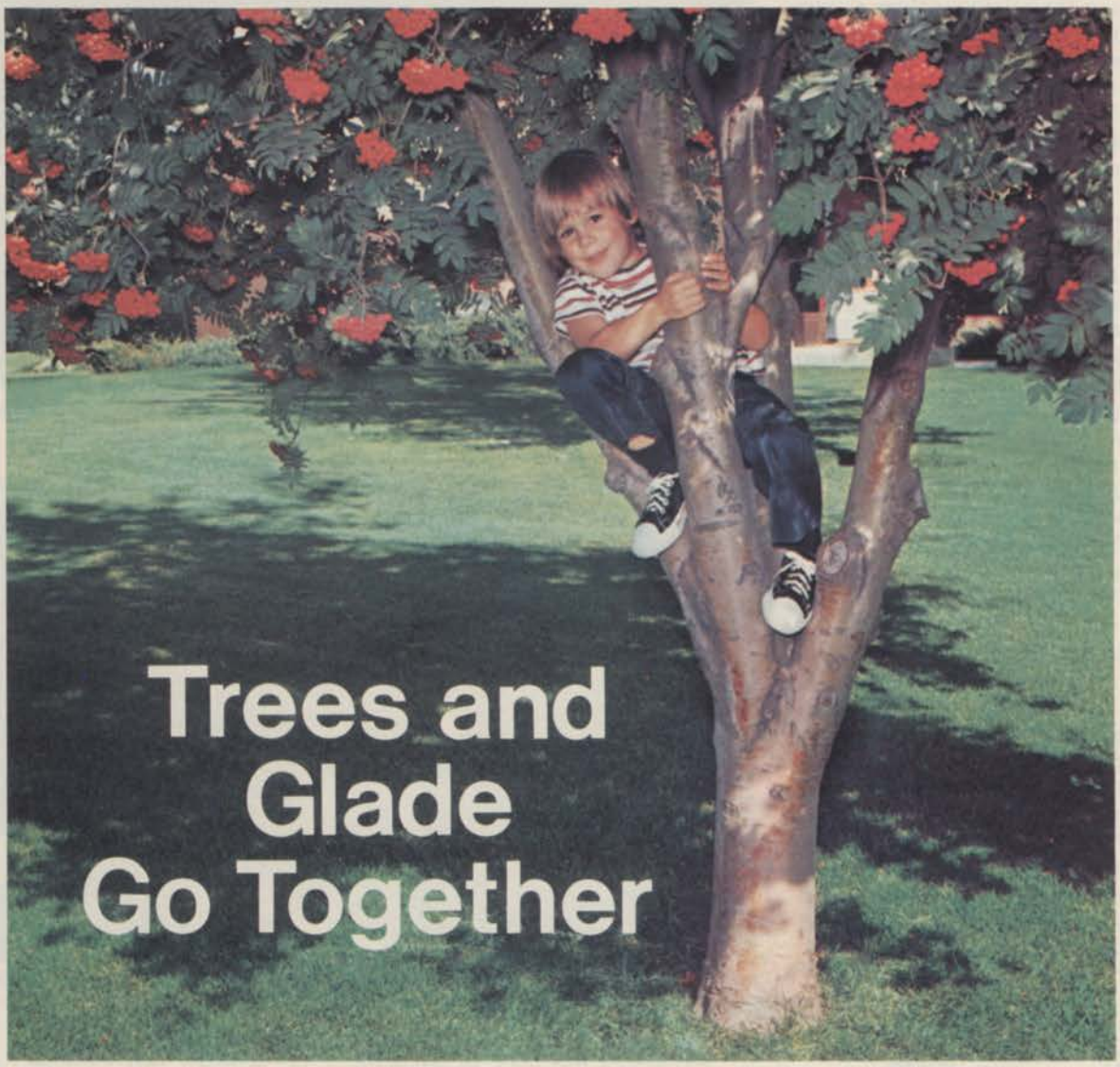
Vets Home Superintendent Cited for Beautification

J. Paul Barefoot, superintendent of grounds maintenance and the Landscaping and Transportation Division of the United States Soldiers' and Airmen's Home in Washington, D.C., has received an honor award from the Beautification Division of the Department of Environmental Services.

Barefoot is responsible for maintenance and improvement of approximately 400 acres of grounds, roads and walks, a nine-hole golf course, 20,000 square feet of greenhouse, and transportation and fleet maintenance.

Having held this position for over 10 years, Barefoot said that beautification of the grounds is one of the more important jobs, since the Home is home for over 2,600 retired army and air force veterans. He said that an abundance of shade trees and flower beds plays an important role in the well-being of senior citizen residents.

Barefoot served as president of the Professional Grounds Management Society from 1971 to 1973, and is currently the president of the Mid-Atlantic Association of Golf Course Superintendents.



A new natural team, Glade Kentucky bluegrass and trees! Glade performs well in moderate shade, especially when mixed with fine fescues. A selection from Rutgers University (tested as P-29), Glade is an improved, low-growing, medium to dark green grass with fine leaf texture and thick, rapid-growing rhizome and root system. Glade has good resistance to important turfgrass diseases including powdery mildew.

Like boys and trees, Glade and shade go together. Mixed with other elite bluegrasses and fine fescues in moderate shade, Glade is a natural.

Get new Glade at local wholesale seed distributors.

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KENTUCKY BLUEGRASS

Another fine product of Jacklin Seed Company

U. S. Plant Patent 3151

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dahl nitrogen assay in laboratory. This gave the relative values shown in Figure 3. The soluble nitrogen onto peat was one standard, and its dissipation from the bag was 97 percent within three days. The slow initial release of IBDU is indicated in the least release shown in the left side of Figure 3.

Generally it has taken ten days for initial color or growth to show from IBDU even where heavy rates and finer particles were used. In contrast, two to three days would be normal for urea or nitrates. In two field tests the coarser IBDU (above 2mm) gave limited response for the first month when applied on nitrogen depleted turf.

The first outdoor research, in 1967, was Purdue's most important with IBDU. We used a small sieve to sort the particles into coarser (above 1 mm — so held on screen) and finer (those through the screen).

This was used side by side in test No. 3 at 2, 4, 6, 8, 10 lbs. N/1,000 sq. ft. as applied 11 July 1967. Throughout 1967 the finer gave more release than the coarser. For the first 50 days, even 4 lbs. of finer produced 70% more clippings than did 10 lbs. coarser. However, the next year the 10 lbs. gave longer and continued response. (Figure 4 shows the color or growth comparisons at 50 days).

Figure 1. Salt and fine particle movement from bags after being dripped into bags and solution dried.

Figure 2. Bag being placed into rootzone of pot. Later retrieved for anaylsis for residual staying in the bag.

Extending this idea, in test 4 on 22 August 67 from one bag of IBDU five sizes were sorted by hand screens as follows: less than .25 mm, .5, 1.0, 2 and more than 2 mm. Figure 5 gives comparative yields of replicated plots at 18, 54 and 119 days of growing weather or 9 Sept. 67, 16 Oct. 67 and 1 May 68. Again, the faster release from finer particles is clearly shown at initial 18 days. Totally, one of more consistent and uniform pattern on bluegrass in this experiment was the 6 lbs. of .5 to 1.0 mm particles. It about doubled yields of the check at each harvest. The coarser particles continued well beyond the 119 days shown. After one year the clipping for one harvest (See Table 2) from equal nitrogen rates illustrates residual release.

Large Particles Research

Would you believe 24 lbs. N/1,000 applied at one time? or 18? or 12? without turf damage or excessive growth? In test 9 we had up to three years of growth response on a putting green where 1 gm. particles (as compressed pillows ⅜ x ¼ x ⅞ inch as shown on Figure 6) were placed at 4 inch depth at 24 lbs./1,000 sq. ft. in a new Purr-Wick green.

Repeated samplings showed the roots would form a fibrous mass around each particle (almost a cocoon effect). Further, the size of the particles gradually decreased over the three years before completely dissolving.

The author has repeatedly encouraged the manufacturer, Mitsubishi Co. of Japan, and USA licensee, Swift & Co., to develop a coarser grade of ¼-⅜ inch diameter as hard pellets for at least two years' release for use in construction. Figure 6 shows representative experimental sizes tested. (Currently a special coarse container

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You're looking at a team of Toro greens maintenance machines. It's called Greensmaster 3, and it's a triplex greensmower that also spikes and thatches greens. As a greensmower, the cutting heads float free of the traction unit and grass baskets for uniform cutting height – it still has no equal. And now, with Toro-engineered implements, it's equally effective as a spiker or thatcher. Your Toro distributor offers our new one year warranty – and a free trial on your own greens. Call him. Soon.

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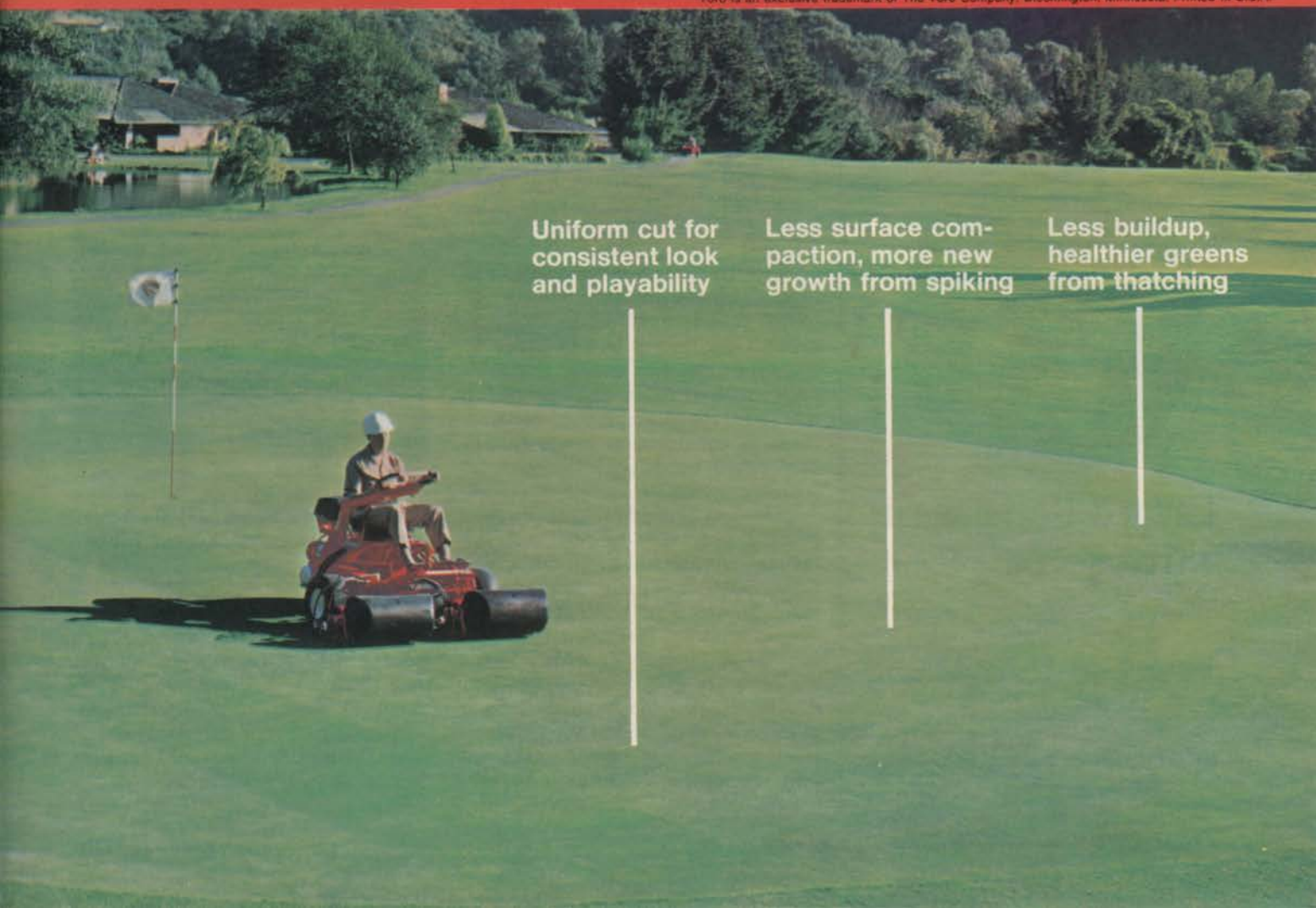

grade is available for ornamental horticulture containers. It also contains fritted P and K, plus minor elements).

One failure was experimentally tried in the fall of 72. An intimate mix of finer IBDU and gypsum plaster was pelleted by rolling and drying. Three sizes, larger (above ⅜ inch), medium (⅜ to ¼ inch) and small (less than ¼ inch) were sorted. The initial application was superb as Figure 7 shows. Our high rates were from 8 to 16 lbs. N/1,000. When freeze and thaw came, the particles slumped and thus the hard ball was reduced to a soft patty and the beneficial effect of coarseness was reduced. In contrast, the compressed hard pellets of previous supply have repeatedly been satisfactory.

Over the years grants from companies have supported research on products in the turf program at Purdue. It has allowed a wide and continuous range of testing products. Milorganite has been a long-term standard based on research in early 1950 and much more. Ureaform formulations were extenstively tested in later 50's, and one is a standard in current tests. The failures of some peat based, powdered and coated sources are also history. For example, standard osmocote particles have been quite large for use on greens, so cracked easily and was picked up by mowers excessively. In fact, a review shows over 20 products from companies have been tested at Purdue since 1950 for turf, and of these, only four are currently on the market.

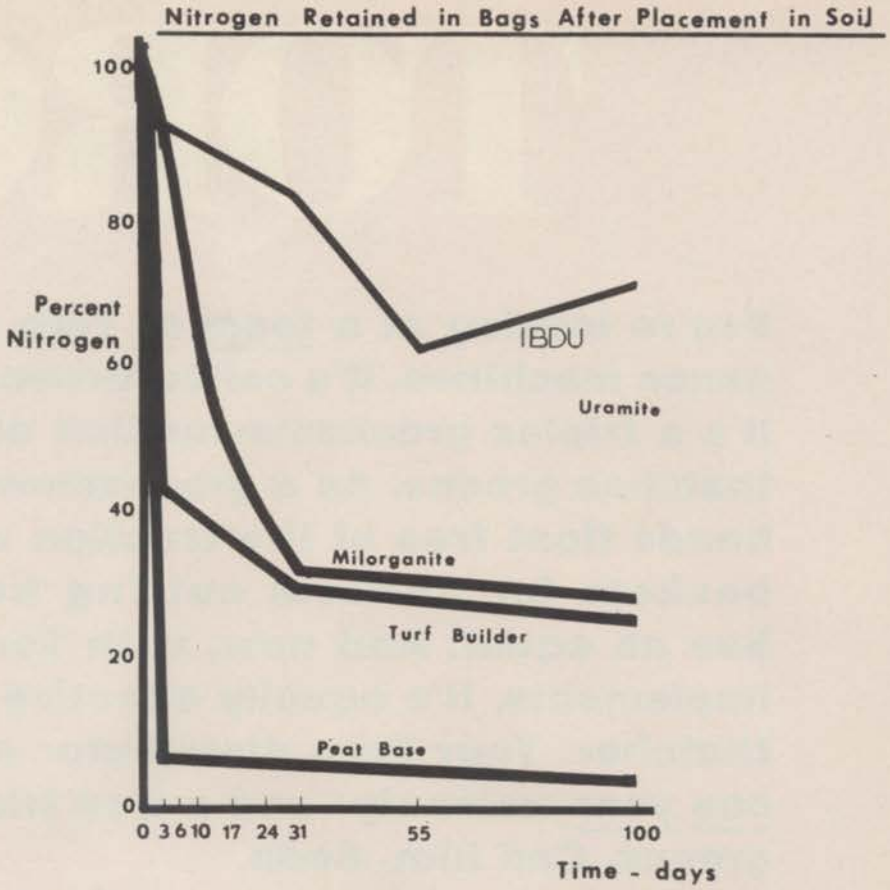

Figure 3. Percent nitrogen retained in bags after placement in soil.

A Look Towards the Future

IBDU, like other special slow release nitrogen sources, will continue to be premium in price. The raw products and manufacturing processes are expensive.

Ideally, three sizes of IBDU are needed. (However, only one size, .7 to 2.0 mm is availble in '75). For greens, less than 1 mm in order to filter into fine turf easier. For fairways, athletic fields and lawns, 1-3 mm size for annual use. Beyond these, a construction grade of 3-5 mm could be 3 year background release.

The fact that IBDU can be specifically processed to release N at the desired rate offers efficient use of labor both in application and in maintenance. The fact that it is free of potential for leaf burn means it may be applied under widely varying weather conditions. The fact that it can provide nitrogen stored as particles dispersed at the turf surfaces means special benefit as the cation exchange complex (storage ability of a soil) is not so critical.

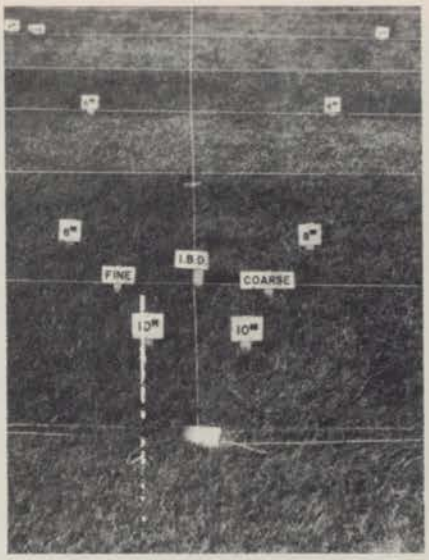

Figure 4. Finer grains on left show more response than coarser on right (taken from the same bag) at 50 days after application on Kentucky bluegrass.

How does this apply to a golf course in 1975? Look at an example — the strong consistent release exceeds 15 weeks, so a turf manager can anticipate repeat applications at about that interval or twice per year in cool season grass areas.

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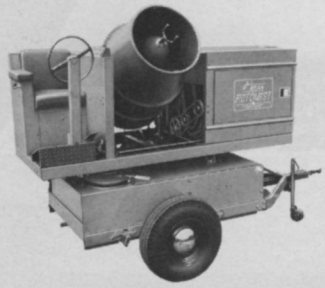
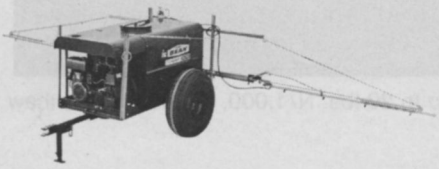
The grass is always greener...and with good reason





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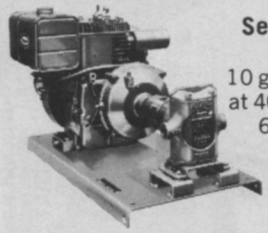

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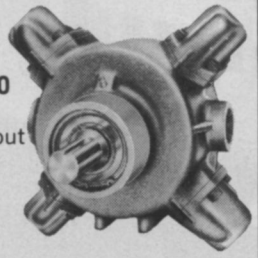

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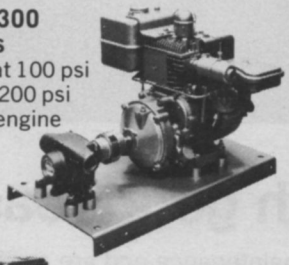

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agers have the opportunity to standardize and streamline applications when IBDU is the sole or major source of nitrogen. The initial visual grass response is about ten days after application. Then release is related to coarseness of particle and moisture supply. And the tail-off of supply is gradual. From these three basic facts, even once a year applications may well be adequate where repeat applications have been made.

For example, on an 8,000 sq. ft. front lawn of Sodco bluegrass a single yearly application of 3 lbs. N/1,000 as IBDU coarse particles (above 1 mm) gave a slow uniform growth for one year. Further, tha advantage of applying the total at any time increased ease and accuracy of application.

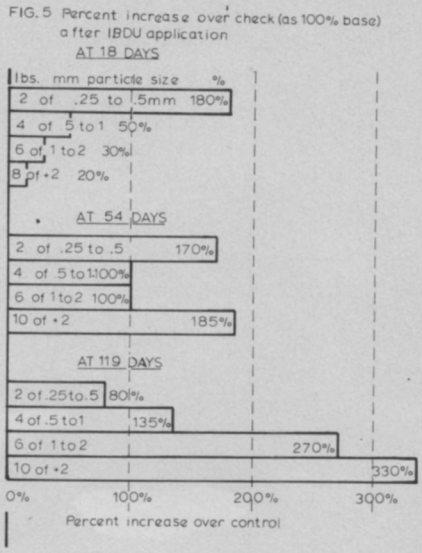

Figure 5.

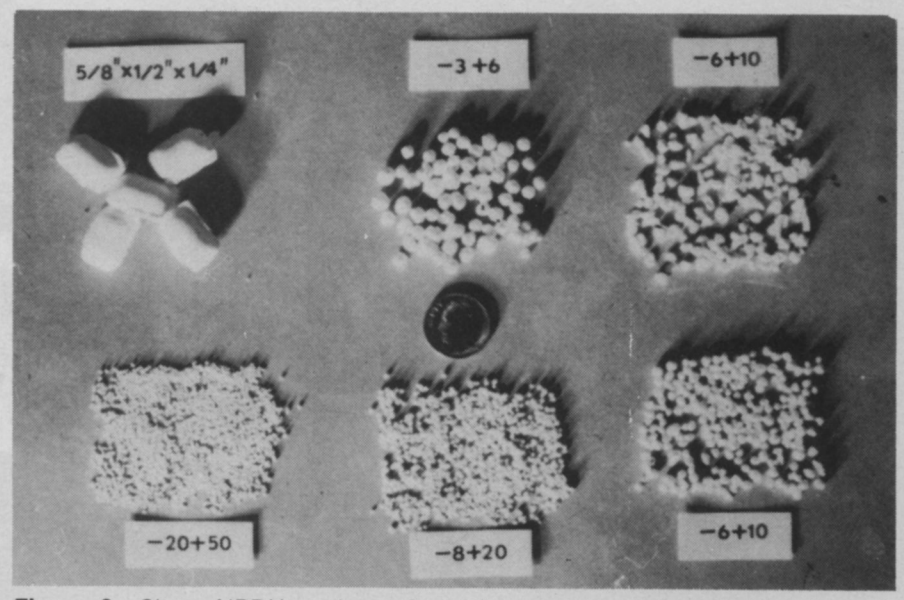

Figure 6. Sizes of IBDU used experimentally. Largest particles lasted three years in Purr-Wick greens.

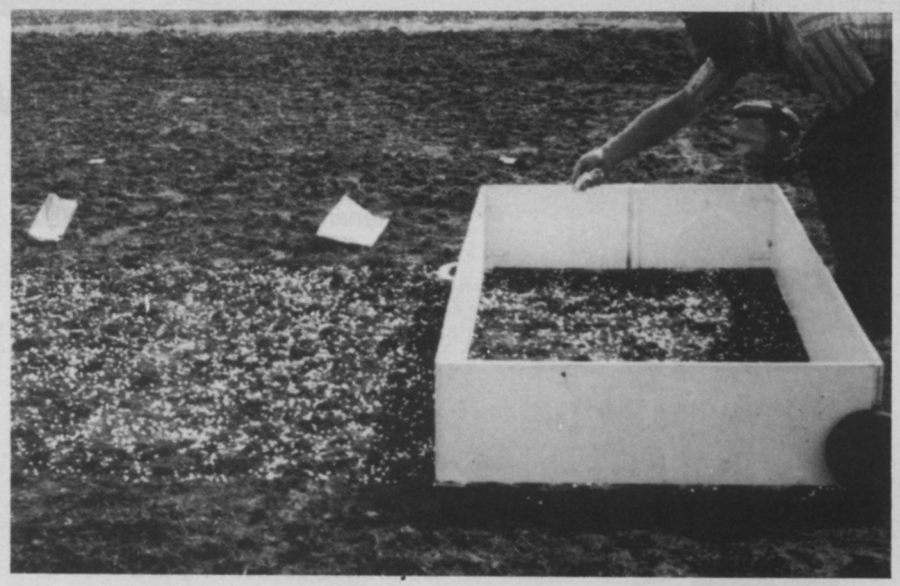

Figure 7. Experimental pellets applied up to 20 lbs. N/1,000, but freeze and thaw of two products in mix caused slump.

PROTECTION *(from page 12)*

The new WILT-PRUF NCF anti-desiccant acts as a conservation agent. It does not completely stop water discharge but it reduces water loss to an acceptable balance with water intake. The daily requirement of water differs with different plants and, furthermore, it is not uncommon to observe that the same variety of plant exhibits different water requirements in different climatic areas.

Adequate plant protection and insurance against adverse weather is generally obtained with a dilution of ten parts water to one part concentrate. However, this dilution can be varied within limit ranging from five to 20 parts of water to one part WILT-PRUF NCF. Because it is non-toxic to plants, the dilution rates can safely be varied to fit local conditions and needs. Assistance in determining proper dosage can be obtained from the use manual supplied upon request by the manufacturer, Nursery Specialty Products, Inc.

The new product is most economically applied to trees and shrubs with a low pressure spray. The sprayer can be of any sort ranging from a mist blower to a standard spray rig. Since the product is easily washed from sprayers, it is no longer necessary to quickly wash them out after use. High pressure application is not recommended because of resulting waste.

Field experience has demonstrated that about 80 percent coverage is as efficient as 100 percent coverage, but care should be exercised to assure coverage of the terminal portions of plants where "soft" or new growth is usually present.

Bare root trees and seedling transplants are generally coated most economically by dipping them in diluted material. Concrete drainage tile cemented into a tube is excellent for dipping bare root trees and cut Christmas trees.

WILT-PRUF NCF is a unique arborist's tool because of its four-season utility. During spring, summer and autumn it serves as plant transplanting insurance. In winter it serves as a plant protectant against drying winds and ocean coast salt sprays. This use of WILT-PRUF may well become as important as its use in transplanting. Homeowners and estate gardeners do not like the inconvenience of spraying anything in winter. Herein lies a great business opportunity for customer spraying.

Some arborists have capitalized on this situation and set up a winter protection spray service. Its reception was excellent and served a number of worthwhile objectives. First, it provided winter work for crews which were normally discharged for the season. Second, it created a new image for the arborist company as a company interested in the year-round health of their customers' landscape plantings. Third, it provided a sense of comfort for the owners of landscape programs. Finally, this service provided an additional opportunity for contact with the customer.

The new NCF differs from its predecessor, WILT-PRUF, and other anti-desiccants in that it is easy to handle in winter, is not toxic to plants or animals, is cheaper to use, leaves no unsightly coating, resists removal by water, is easy and safe to apply, permits free exchange of carbon dioxide and oxygen and exhibits only slight reduction of photosynthesis. Basically, it is an ecologically safe protection against excessive and harmful water loss.

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Penn State Chemist's Findings Contradict Current Theories

A PENN STATE chemist has found evedence that plants control mating in insects — a finding that contradicts current theory and sheds new light on evolution in insects and the sense of smell in man.

The finding also casts serious doubt on the value of pest control programs involving sex lures to disrupt mating. Funding for such programs currently runs into the billions of dollars and includes efforts against the gypsy moth, oak leaf roller moth, corn borer and boll weevil.

Such programs are based on the assumption that female insects manufacture their own lures and that there is a single attractant unique to each species to which the male will respond.

But Dr. Lawrence B. Hendry, assistant professor of chemistry, claims the attractants originate in the plants on which the insects feed.

He believes that the female insect simply stores the attractants, called pheromones, and apparently does not change them in any way. Hendry has found the attractants in plants in concentrations that correspond to the amounts found in females and also has evidence that the males of a single species can be sensitive to as many as 20 different chemicals, depending on their diet.

According to Hendry, the females probably learn which pheromone to store and the male learns which one to seek while the insects are still in the egg or larval stage. He theorizes that the brain of the insect becomes imprinted or programmed to respond to whatever pheromone is present in its earliest food. Thus, only male and female insects which feed on the same plants as larvae would be imprinted with the same attractant and mate as adults.

The unpredictability of the field response to laboratory-prepared lures has only mystified researchers. A chemical that produced excellent results in the laboratory would sometimes produce mediocre or negative field results. The apparent contradictions, Hendry said, were the result of the different diets of the laboratory-reared and wild insects. For example, a pheromone that worked as an attractant for oak leaf roller moths reared in the laboratory on wheat germ would not work for the same insect raised in the wild on oak leaves. The attractants would even be different for one set of oak leaves and another raised on later-leafing black oak leaves.

"It could be that the receptor site is non-specific and can be taught to respond to many substances," he said.

If this guess proves true, Hendry said that pest control programs based on sex lures might still be possible, such as a program based on spraying a field with some chemical the insect larvae would eat and imprint. Later the same chemical could be used as a sex-lure to confuse the males and prevent mating.

One reason the finding is so startling, Hendry said, is the fact that insect species have been defined according to their ability to react to specific attractants. Now, he said, this definition may have to be changed. Theories of insect evolution based on the idea that insects from different species will not mate, may also have to be changed, according to Hendry.

In addition, he has found what may be a chemical link between the sense of smell in insects and in man. He has discovered that the chemical structure of the sexual excitant of the oak leaf roller moths closely resembles musk, a common constituent of many perfumes. To Hendry, this finding hints that man may also respond to some smells through imprinting rather than through a set of specialized receptors on the olfactory nerve. This could be interviewed to mean that diet affects mating selection, and, over the long haul, evolution — or, you are what you eat.

One of the first major clues to the discovery of the plants' role in insect reproduction came when Hendry saw a group of oak leaf roller moths attempting to copulate with some oak leaves that had been damaged by larvae. He decided to examine the oak leaves for evidence of pheromones and assigned one of his students, Joseph Wichmann, a senior chemistry major, to the task. Wichmann found evidence of the pheromone and Hendry, stunned by the news, accused him of accidentally contaminating the samples.

David Hindenlang, Ph.D. candidate in chemistry, was then drafted to analyze the material Wichmann had isolated from the plants. Hindenlang's verdict: it was the oak leaf roller sex attractant. Hendry's response this time was to question the accuracy of the instrument used. He bought a new instrument 100 times more sensitive and it gave the same answer.

Both students, along with junior chemistry major Mary Elizabeth Anderson, who did earlier work on the oak leaf roller's sensitivity to various suspected attractants, are included with Hendry as authors of the report.

So far, the chief insect that Hendry and his research group has studied is the oak leaf roller. But, he has also found the pheromones of 20 apple-feeding insects in apple trees, those of cabbage-feeding insects in cabbage and those of mushroom-feeding insects in mushrooms.

The research program was supported, in part, by a grant from the Research Corporation. Hendry was also aided by Ralph O. Mumma, professor of pesticides.

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Energy Saving Suggestions For Turfgrass Managers

By James A. Fischer
The Toro Company

Editor's note: The following was presented by James A. Fischer, director of marketing, Turf Products Division, Outdoor Power Equipment Group, The Toro Company, before the Ohio Turfgrass Conference, Dec. 5, 1974.

Wellhead prices in the oil-rich Arab countries have increased from $3 to over $12 per barrel in less than a year. Early in 1974, fuel prices almost tripled and fuel was scarce. While the situation has eased somewhat, many government and industry experts feel that winter and spring will again bring shortages and higher prices.

Turf managers can effectively save fuel by following these tips.

Equipment:

- Maintain good contact with fuel suppliers. Ask for recommendations of your storage capacity needs. Firm up contracts and prices.
- Fuel costs represent two to three percent of your total budget. Should fuel prices again increase, major savings will accrue through efficient labor force management.
- Evaluate equipment against the tasks to be done.
- Tune and maintain all equipment in accordance with owner's manuals and establish preventive maintenance procedures.
- Establish preventive maintenance procedures.

Facilities:

- Lower working temperatures in office and shop.
- Minimize interior and exterior lighting.
- Seek alternative heating methods and do not heat or cool non-essential areas.
- Consider using insulation throughout the facility.

Turfgrass:

- Review all cultural practices and techniques.
- Test soils to determine pH and nutrient levels and review fertilizer programs and products.
- Evaluate watering and mowing schedules — frequency, timing and location.
- Correct all drainage problem areas.
- Evaluate adaptation and use of turfgrass varieties you now have versus "new" improved selections.
- Use fertilizer, water and chemicals efficiently.
- Use pesticides wisely for control of pests, weeds, insects and diseases.
- Evaluate height of cut in relation to type of mowing equipment.

Your People:

- Review all tasks and establish priorities.
- Schedule equipment use to attain maximum efficiency.
- Retrain operators on mowing techniques, equipment operations and adjustments.
- Combine tasks, eliminate non-essential travel.
- Stock high use parts and use United Parcel Service for emergency deliveries.
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Right behind the spreader. . .or 20 feet to each side. . . your turf gets the same amount of fertilizer if you use a Vicon. Field tests have proven it.

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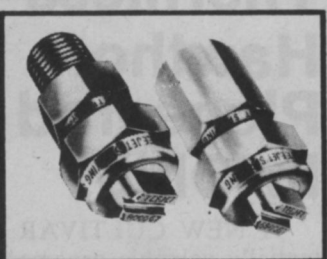

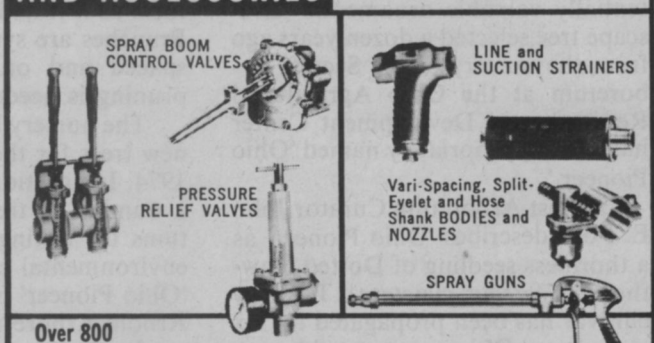

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PROMPT SHIPMENT FROM STOCK

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The 'Ohio Pioneer Dotted Hawthorn," a thornless hawthorn which has been propagated for six years by an Ohio nursery, is now on the market. The cultivar was selected 12 years ago from the nursery of the Secrest Arboretum, Wooster, Ohio.

Thornless Hawthorn Pioneered In Ohio

A NEW CULTIVAR of a potentially valuable ornamental landscape tree selected a dozen years ago from the nursery of the Secrest Arboretum at the Ohio Agricultural Research and Development Center has been appropriately named 'Ohio Pioneer.'

Secrest Arboretum Curator John E. Ford describes 'Ohio Pioneer' as a thornless seedling of Dotted Hawthorn *(Crategus punctata)*. The new cultivar has been propagated for six years by an Ohio nursery and is now available commercially. Formal registration of the tree is being made with the Arnold Arboretum in Boston, Mass., which serves as the international registry for cultivated forms of this species.

Ford says Dotted Hawthorn is a native thornapple which grows throughout much of the northeastern U.S. northward and eastward from Iowa and Indiana. It also grows at higher elevations southward along the Appalachian Mountain range.

Normally, the tree is small, seldom growing much more than 20 or 30 feet in height. It has clusters of white flowers in May, and dark red fruits are developed by September or October.

The Dotted Hawthorn, although an attractive tree, has not been widely planted because of the abundant extremely sharp thorns.

In 1962, a thornless seedling of Dotted Hawthorn was found in the Secrest Arboretum nursery at Wooster, Ohio. It had only three small thorns on it at an age of 10 years, and when these were pruned, none reappeared. Credit for selection of the new tree goes to Dr. O. D. Diller, curator emeritus of Secrest Arboretum.

Six years ago, shortly after Ford joined the Arboretum, a horticulturist from Coles Nursery in Circleville, Ohio, saw the trees at Wooster and felt the new cultivar had the best potential of any thornless hawthorn he had seen. He envisioned a whole new market resulting from the new cultivar's introduction. The Arboretum began supplying the nursery with bud sticks from the tree and these were budded on Washington Hawthorn rootstock. Only a low percentage of the resulting budded trees developed juvenile thorns, and these were easily pruned.

Ford says from the nurseryman's standpoint, the 'Ohio Pioneer Dotted Hawthorn' is a good tree to handle because every tree is as uniform as if it had been factory made. Branches are symmetrical and well-spaced and only slight corrective pruning is needed.

The nursery began marketing the new trees for the first time in fall of 1974. In addition, Ford has shipped a number of trees to other arboretums for testing under a variety of environmental conditions. Plants of 'Ohio Pioneer' have been planted at Arnold Arboretum of Harvard University in Massachusetts; National Arboretum, Washington, D.C.; Ida Cason Callaway Gardens, Pine Mountain, Ga.; University of Minnesota Arboretum; and Dawes Arboretum, Newark, Ohio.

'Ohio Pioneer' trees have been set in the Secrest Arboretum shade tree evaluation plots to determine their best use in urban areas. Ten of the trees have been ordered by the city of Wooster for planting on selected sites along the city's streets.

Hughes Appointed Director Of Forest Research Staff

Jay M. Hughes, research specialist in forest economics, has been named director of Forest Service Economics and Marketing Research Staff, Washington, D.C., succeeding recently retired H. R. Josephson.

Hughes is a graduate of the University of Colorado with a bachelor's degree in economics and a masters degree in forestry from Colorado State University. His Ph.D. in forest economics was earned at Michigan State University. Beginning his forestry career as an assistant ranger at the Roosevelt National Forest in Colorado, Hughes soon transferred to a position in forest products marketing research at the Forest Service Rocky Mountain Forest and Range Experiment Station in Fort Collins, Colo., later moving to the Pacific Northwest Forest and Range Experiment Station in Portland, Ore., as head of multiple use and production economics research.

In 1966, he turned to academic life with appointment as associate and later full professor at the University of Minnesota College of Forestry. Three years ago, he returned to federal forestry and was appointed director of the Forest Resources Program in the USDA's Cooperative State Research Service in Washington, D.C. In 1972, he was named Chief of Forest Survey in the Forest Service.

Toro Builds Casting Plant

The Toro Company has announced acquisition of die-casting equipment of the CharLynn Division, Eaton Corporation, Cleveland, Ohio, a major source of aluminum housings used in Toro's rotary mowers.

According to David T. McLaughlin, Toro's president, the equipment will be re-located in a new $2 million plant to be built in Shakopee, Minn. Construction is expected to begin immediately and to be completed by the summer of 1975, with full production scheduled for the fall of 1975.

The 50,000-square-foot, one-story structure will be located on a recently purchased 10-acre site. Until the new plant is complete, CharLynn will continue to operate the equipment at its facilities in suburban Eden Prairie, Minn., McLaughlin said.

Maintaining an effective turf-care program often becomes a contest between you, nature and the budget. *And professional turf-care managers know the value of having top* quality, precision-built equipment in their line-up.

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1 **Greensaire II.*** Second generation of the Ryan coring aerator. Removes cores on 2" centers down to 3" depth.

2 **Core Processor.*** Attaches to Greensaire II. Processes cores, picks up plant material and returns soil to green.

3 **Spikeaire.*** Disc spiker for aeration.

4 **Mataway.*** Heavy-duty deep slicer and disc spiker.

5 **Ren-O-Thin.*** Removes thatch, grooves for seed, pulverizes aeration cores.

6 **Turf Minute-Miser.*** Personnel transportation and towing ball pickers, Greensweep, utility trailer.

7 **Greensweep.*** Picks up cores, thatch, debris from greens, turf and pavement.

8 **Spread-rite.*** Top dresser, fertilizer spreader. Handles sand, too.

9 **Renovaire.** Turf aerator for large, contoured areas. Interchangeable tines for coring, slicing, open spoon aerating.

10 **Tracaire.** Three-point hitch aerator.

11 **Pro-Edge.*** Professional edger.

12 **Rollaire.*** All-purpose roller.

13 **Sod Cutters.*** Self-propelled heavy-duty and junior models.

14 **Lawnaire.*** Home lawn aerator.

*Self-powered and/or propelled.

RYAN
TURF-CARE EQUIPMENT
OMC-Lincoln, a Division of Outboard Marine Corporation
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P.O. Box 82409,
Lincoln, Nebraska 68501

The turf-care line-up.

For More Details Circle (155) on Reply Card

Melnor's Midwest Rep. Retires After 20 years

Melnor Industries of Moonachie, N.J., a leading manufacturer of lawn sprinklers and garden care products, has recently announced the retirement of Robert S. Black of Kansas City, Mo.

Black has represented Melnor for over 20 years in the states of Missouri, Kansas, Iowa, Nebraska and southern Illinois.

According to Eugene C. Okin, vice president of marketing for Melnor, these states will now be serviced by Byler & Associates, Kansas City, Mo., who have over 20 years experience in the hardware/houseware industry.

Algae Problems? IN ponds lakes fountains reservoirs fish tanks farm ponds waterholes swimming pools irrigation canals therapeutic baths water cooling towers air conditioning systems

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San Antonio's Harold Henk Named Turfgrass President

Harold Henk, San Antonio's superintendent of parks, is the new president of the Texas Turfgrass Association.

Henk was named to the post during the 29th annual Texas Turfgrass Conference at Texas A&M University. He succeeds Herman Johnson, landscape architect in Corpus Christi.

Dwight Anderson of Dallas City Parks Department was elected vice president, and Amos Mills of Watson Distributing Company, San Antonio, was chosen as executive secretary.

A record 435 persons registered for the conference according to Richard L. Duble, program chairman. Twenty-four commercial exhibits were also featured, Duble said, and the Association presented $2,600 in scholarships to A&M agronomy students specializing in turf.

Municipal Arborists Group Elects Officers for 1975

Richard W. Boers, commissioner of forestry, Toledo, Ohio, was reelected president of the Society of Municipal Arborists at the 10th annual meeting in Chicago, Ill. Joseph H. Plante, Jr., city arborist, Providence, R.I., was elected vice president and Harold Robson, director of parks and forestry, Lake Forest, Ill., was elected to the executive committee.

Approximately 90 municipal arborists from Maine to California attended the three-day convention which included two days of meetings and a one-day bus tour of street trees in surrounding suburbs. Each delegate represented one city. The tour also included a visit to the Chicago Horticultural Society Botanical Garden for lunch and equipment demonstrations.

During the business meeting, members approved a resolution to contribute $2,100 from the society treasury to co-sponsor a film on the safe use of pesticides.

The 1975 meeting will be held at the Holiday Inn, Hartford, Conn., Oct. 1-3 with Victor J. Jarm, director of parks and recreation, as local chairman.

Plant Propagator Society Honors 3 Horticulturists

Three University of California scientists were honored for their contributions to horticultural science.

Dr. Curtis J. Alley, a specialist in viticulture at UC Davis, Dr. Hudson T. Hartmann, professor of pomology at UC Davis, and Dr. Mildred E. Mathias, professor of botany emeritus at UCLA and director of UCLA's botanical gardens from 1956 to 1968, received merit awards from the International Plant Propagators Society during the 15th annual meeting.

Agrico Marketing Group Redefines Ag Sales Areas

A restructuring of Agrico Chemical Company's marketing department was announced by Agrico group vice president of marketing, R. R. Johnson. Agrico is a subsidiary of The Williams Companies.

Johnson said the new structure of the marketing group is responsive to Agrico's plans for increased production. Agrico's production is expected to increase by 50 percent by mid-1975 as a result of current expansion programs. The change, Johnson said, divides the marketing department into "agricultural" and "non-agricultural" sales areas.

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Donald Pfleiderer, Ph.D., Ohio State University, is head of Country Club's Professional Division. He is among the country's Foremost agronomists and is author of the Agronomic Bulletin.

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Turf Products

"I stake my reputation on the dependability of Country Club Fertilizer – and so can you. We've proven our products work more efficiently. Here's how.

Before any new Country Club product is introduced, it must go through extensive research and testing. It is tested on field plots under varying conditions. It is tested through plant analysis and researched under controlled conditions in greenhouses.

In its final form, nothing is sacrificed. Every element and process necessary for turf growth is utilized, enabling Country Club to give you more feeding power for your money.

The top of our line products have more WIN, higher organic content, more sulphate, magnesium, sulphur, iron and manganese. Sizing is either small for greens or regular which we call fairway sizing. These and all other Country Club products contain the applicable balance of WIN and water soluble nitrogen to allow immediate green-up and provide long-term greening – with a minimum number of applications. Based on your specific course requirements, two or more of these products will work efficiently to complete your fertilizer needs."

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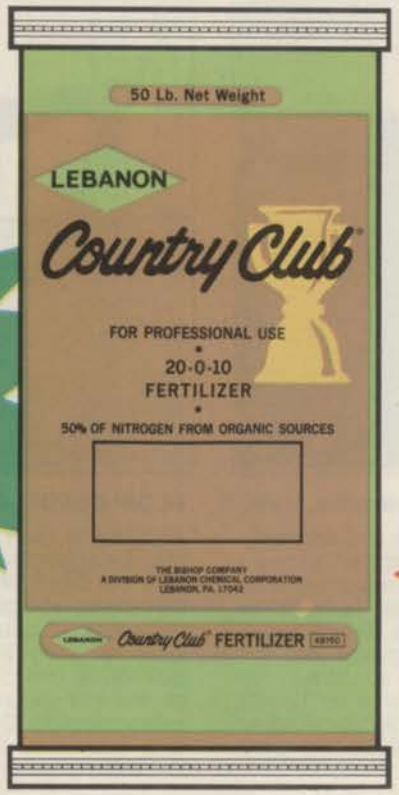

Golf Course Superintendent Show
New Orleans — Booth No. 995 - No. 1005

LEBANON AGRICO

Good Names To Grow By

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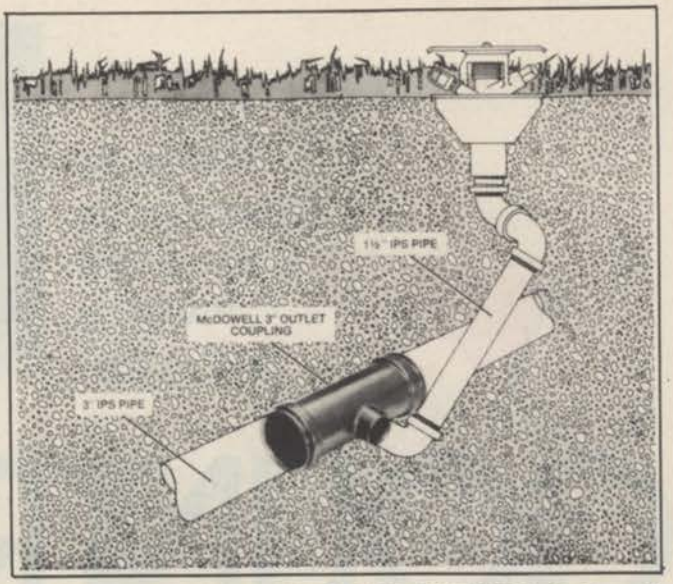
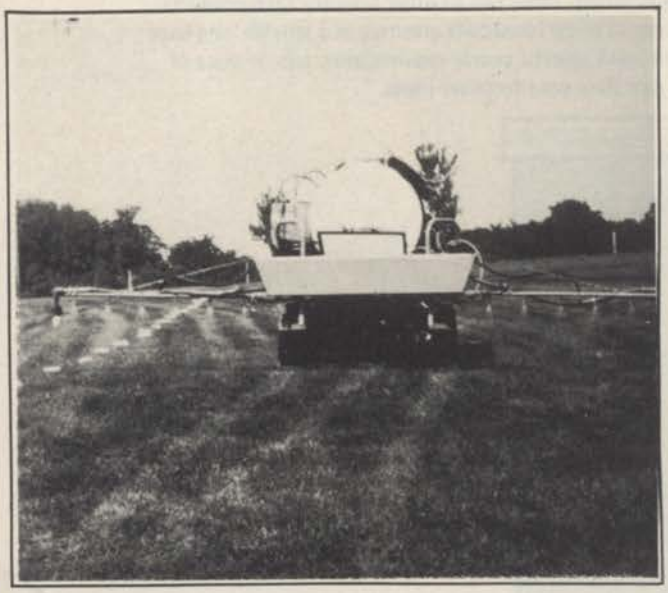
POWER BRUSH: Gravely, Clemmons, N.C.

Gravely 44-in. Power Brush attachment sweeps light snow, dirt and debris away, right down to the pavement. Sweep direction can be adjusted from operator's position. Contact pressure can be adjusted by separate adjustment controls on each side of the brush housing. Manufacturer says the most important durability feature is absence of belts to slip or break. Brush is driven with a ⅝ in. sprocket chain and supported with self-aligning ball bearings. Dimensions are: L 32 x W 52 x H 19 inches. Brush dimensions: 18-in. diam. x 44-in. length. Casters: 6-in. diam. Angle adjustment to the right, left or straight ahead. For more details, circle (701) on the reply card.



EPOXI-LOKT® COUPLINGS AND FITTINGS: McDowell Manufacturing Co., DuBois, Pa.

New line of epoxy-coated steel couplings and fittings for sprinkler irrigation systems is used to connect underground PVC pipe, combining strength with ease of installation and providing expansion joints where new couplings or fittings are used, manufacturer says. New line features Outlet Coupling with 1½ in. female thread outlet compatible with pop-up or stab-type sprinklers and connecting 3 in. IPS PVC pipe having a 3½ in. outside diam. Weighing 1¾ pounds, coupling is applicable to systems with working pressures up to 160 psi. For more details, circle (702) on the reply card.



TURF MARKER: Richway Products, Inc., Janesville, Iowa.

New turf marker designed for golf course, park and cemetery sprayers and sod farmers is said to eliminate problem of overlap and missed strips by showing sprayer operator covered areas regardless of terrain. As sprayer moves, Turf Marker deposits dense foam balls every 4 to 6 seconds. Balls are said to be highly visible (even at night), to disappear into the ground, and life of balls may be controlled by adjustment for short or long periods. Marking system is powered by 12-volt DC source. Foam balls are said to be unaffected by wind or sprayer boom whip. For more details, circle (703) on the reply card.

PLOW BLADE: Charles Machine Works, Inc., Perry, Okla.

An optional plow blade to provide full 18-inch cover, which may be substituted for standard 12-inch blade, is now available for Ditch Witch VP12 vibratory plow. VP12 is a self-contained, self-propelled unit for making underground installations without trenching for many uses — sprinkler systems, utility lines and communications cables. VP12 is built on a one-piece frame, powered by 25 hp air-cooled engine and features separate mobile and plowing ranges and power steering. Differential drive to wheels is designed so turning causes minimum turf disturbances, manufacturer says. For more details, circle (704) on the reply card.

For More Details On Following Page Circle (158) On Reply Card ▶

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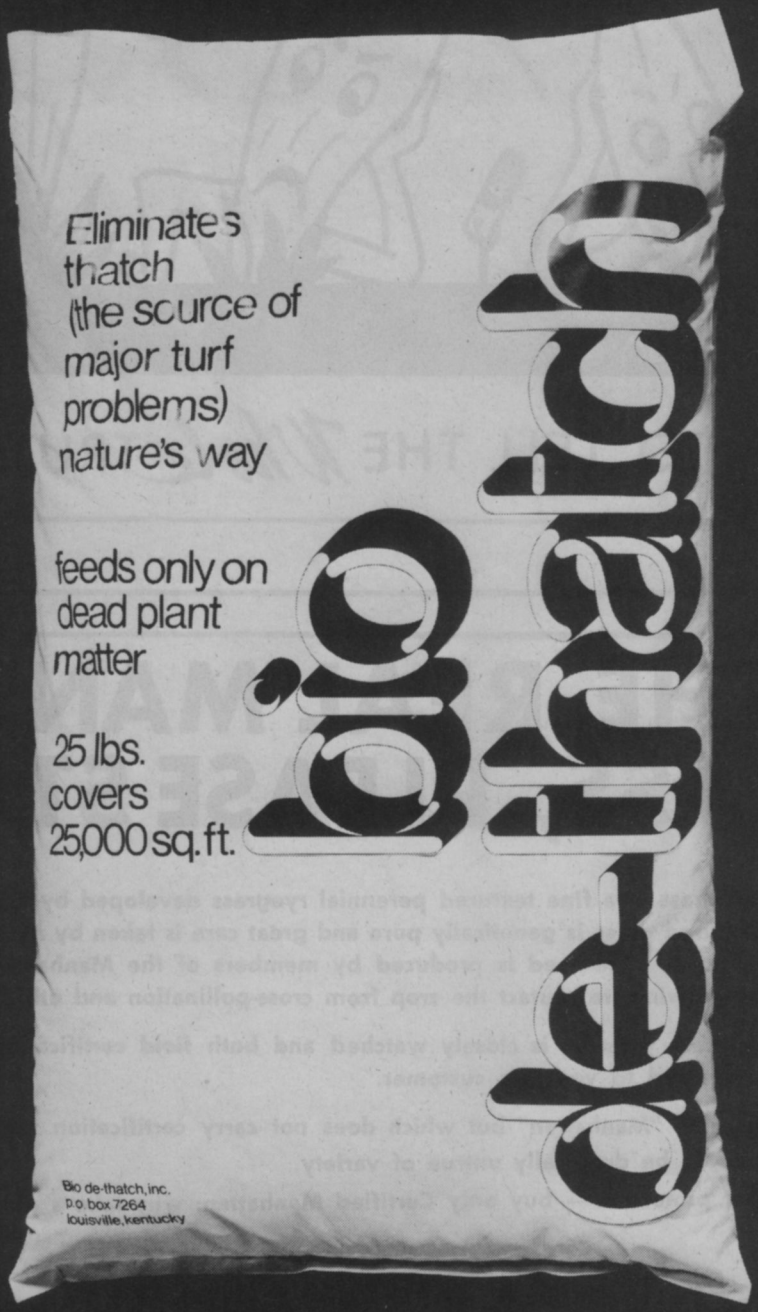
Eliminates thatch nature's way.



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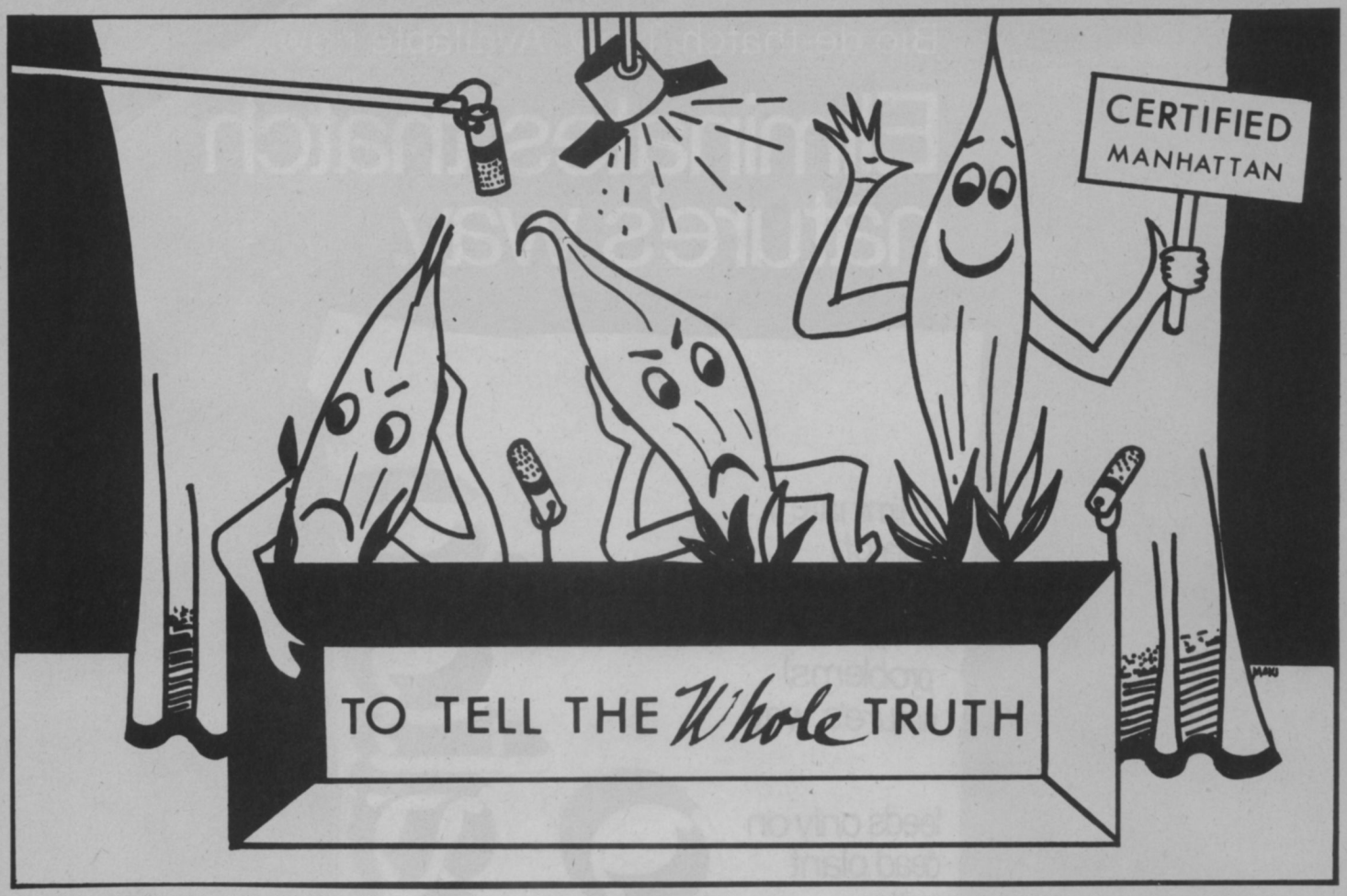

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Manhattan perennial ryegrass is a fine textured perennial ryegrass developed by Dr. Reed Funk, Rutgers University. This new, improved, fine textured grass is genetically pure and great care is taken by Manhattan Association growers who plant only foundation seed stock. The seed is produced by members of the Manhattan Ryegrass Growers Association who agree to strict rules of growing, to protect the crop from cross-pollination and other contaminants.

The seed produced by these growers is closely watched and both field certification and seed certification are required before the seed is released to you, the customer.

Any seed bearing the name "Manhattan" but which does not carry certification tags may not be truly Manhattan. The variance could be drastically untrue of variety.

For your protection — buy only Certified Manhattan; why take a chance on imitations?

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classifieds

When answering ads where box number only is given, please address as follows: Box number, c/o Weeds Trees and Turf, 9800 Detroit Ave., Cleveland, Ohio 44102.

Rates: All classifications 50¢ per word. Box number, $1. All classified ads must be received by Publisher the 10th of the month preceding publication date and be accompanied by cash or money order covering full payment.

FOR SALE

ARPS stump cutter teeth, top quality and best price in U.S.A., D. J. Andrews, Inc., 17 Silver St., Rochester, New York 14611. Call 716 235-1230.

USED EQUIPMENT

FOR SALE: Sprayers: used and new; hydraulic and mist, all makes; Royal 20, 35, and 55 pumps. Used rotomist parts, big discount! Phone 313 665-5338 or 313 994-3110. Write: Ralph McFarland, 209 Pleasant Place, Ann Arbor, Michigan 48103.

TWO — 1970 ASPLUNDH 12" chipper, 4 cylinder both like new, asking $2,600.00 each. No. 1560 Vermeer stump cutter, 1968 with new motor, $4300.00. 1973 Chevy C-65 dump truck with 20' Prentice loader, 16,000 miles, asking $14,000.00. Levco stump cutter to mount on 100 horsepower tractor, $4,000.00. Shred King tree eater, $4,800.00, tractor mount. Myers sprayer 200 gallon tank, 10 gpm, skid mount, $600.00. 1967 International Harvester loader cab, 1000 hours, four and one bucket, $5900.00. Edwards Tree and Leasing, phone 216 967-6750.

FOR SALE stump cutter. Vermeer model 1560, good condition $2000.00. Phone 517 484-5780.

STUMP grinder log splitters, chippers, sprayers, bucket trucks, all reconditioned; let us know your needs, Essco, 5620 Old Sunrise Highway, Masspequa, New York 11758. Phone 516 799-7619.

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SOD QUALITY Merion Seed for discriminating growers. Fylking, Delta, Park, Newport, Nugget, Adelphi, Cheri, Glade and Baron bluegrasses as well as fine fescues. Also Manhattan fine leaved rye grass. We will custom mix to your specifications. Michigan State Seed Co., Div. of Vaughan-Jacklin Corp., Grand Ledge, Michigan 48837. Phone No. 517 627-2164.

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DISTRIBUTORS for D. J. Andrews, Inc. stump cutter teeth, pockets and bolts. Best wholesale and retail price in U.S.A. Add to this exclusive area, local advertising at our expense, etc., and you have our story. D. J. Andrews, Inc., 17 Silver St., Rochester, N.Y. 14611. Call 716 235-1230, or 716 436-1515.

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TREE APPRAISALS, Surveys, loss evaluations and expert consultation services. For names of members of the American Society of Consulting Arborists, Inc., throughout the country, contact: Executive Director ASCA, 12 Lakeview Ave., Milltown, New Jersey 08850.

PUGET SOUND TREE SERVICE, INC., 1111 No. 98th St., Seattle, Washington 98103, Stump Chipper Teeth and pockets for the Northwest. Phone 206 523-2240.

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GUEST EDITORIAL

(from page 23)

talk about fertilizer being taken from the golf courses in America to supply farmers in developing nations. What is needed is funds from the wealthier countries to secure fertilizer deliveries and to help pay shipping charges to the users."

Recent commentaries on nonfarmer fertilizer use have tended to imply that their usage is frivolous and entirely dispensable.

Briefly the benefits and implications are more important to our environment and life style than have been implied:

1. Over 30,000 retail outlets receive 15% of their business income from these products.
2. 11,000 golf courses require nutrients to maintain playing surfaces.
3. Green belts and home lawns in metro-areas contribute to cooler summers and purer air. The average home lawn absorbs enough carbon dioxide (a pollutant) and releases oxygen to provide enough for 8 persons.
4. Home vegetable gardens are said to number 57 million by recent Gallup Poll. An important contribution to good diet and lower cost meals.

It is hard to understand why the focus of attention has turned to such a small factor in an attempt to solve a complex problem of world food supply.

Sacred cows in India wander the countryside; a religious phenomena that ignores the protein available and the food stuffs consumed in sacrosanct survival.

In the long run reason will prevail and objective analysis will seek out the balanced solutions to man's most basic needs. Must the short term irrationality always create dislocations that cause more damage than good.

trimmings

Promising alternatives for DDT are being tested by U.S. Forest Service scientists for future control of Tussock moth epidemics. So far three control materials have shown promise during research efforts and pilot projects over the past few years during the moth epidemic in Oregon, Washington and Idaho. These results were among key conclusions reached in a Forest Service, USDA report recently delivered to EPA. EPA granted approval to the Forest Service to spray nearly 430,000 acres of forests in the three states, using DDT to protect the forests from further damage. The DDT-treated areas resulted in a 98 percent average moth mortality. Forest Service chief, John R. McGuire, said the most promising materials evaluated appeared to be a chemical insecticide, carbaryl, and two biological agents, a nucleopolyhedrosis virus and a bacterium called *Bacillus thuringiensis.*

Motor-fuel consumption in the U. S. during 1974 is expected to show a decrease for the first time since 1943. Consumption is expected to be 110.7 billion gallons this year, a decrease of 3.2 percent below 1973 figures. Total consumption for each of the first six months of 1974 shows a decrease from the corresponding months of 1973. The estimate by the Federal Highway Administration is based on individual state reports.

Directing the destructive efforts of a moth called *Coleophora Parthneica* are a couple of University of California researchers. The moths, a natural enemy of the Russian thistle, were imported from Pakistan and Turkey for their ability to control the weed. The moth "glues" its eggs on weed leaves. Hatching larvae burrow into leaves, then into branches and stems, devouring the weed's inner tissues. The weed now costs the state of California millions of dollars to control and in agricultural losses.

Final stage of ICI United States, Inc., agricultural research network was recently completed with the opening of their Champaign, Ill. development center. The 20-acre center evaluates developmental crop protection chemicals such as insecticides, fungicides, nematicides, plant growth regulators and herbicides, for use in the Midwest. Similar research is being carried out at their three other locations across the country.

Newly established EPA Office of Transportation and Land Use Policy has a new director. John O. Hidinger, the new appointee, will be responsible for developing land use and transportation related regulations, and for providing technical assistance on these matters to EPA's regional offices and to state and local agencies.

Speaking of EPA expansion, there are now some 55,000 people directly employed in EPA-financed construction activity, and that by the middle of 1977 that number will more than double — to approximately 125,000, according to administrator Russell E. Train. Train also said, "There is simply no evidence that environmental requirements have had or will have any marked adverse impact upon jobs or existing productive capacity, especially since investments in environmental protection create new markets, new jobs and new profit opportunities." He made these remarks in his opening address at the one-day White House Conference on Domestic and Economic Affairs in Portland, Oregon.

A new USDA proposed amendment for administering the Plant Variety Protection Act would require publication of information by an applicant for protection of a newly developed plant variety that seed of the plant shall be sold "by variety name only as a class of certified seed." It would require showing the number of generations that the variety may be certified. Under present regulations, such information from pending applications cannot be published without the specific approval of the applicant. The Act offers protection against unauthorized exploitation by others of protected seed-producing plant varieties. The Act has been in effect since late 1970.

Intravenous feeding has saved a local landmark from the ax. An eight-foot in diameter elm tree, which has stood on the campus of Virginia Tech since pre-Civil War days, was stricken with Dutch Elm Disease. Tech plant pathologist, R. Jay Stipes, directed the intra-vascular treatment which has bought further time for the historic tree.

An Aldrin and Dieldrin objective report has been published by the Council on Agricultural Science and Technology. The report summarizes facts as viewed by 16 agricultural scientists. For more information contact C. A. Black, Executive Vice-President, CAST, Agronomy Department, Iowa State University, Ames, Iowa 50010.

In this time of tenuous economic environment, Toro Company reports their ten-year growth trend in sales and earnings have increased through this period at a compounded annual rate of 18 percent and earnings per share increased at 17 percent.

New materials on our environment from EPA are available in single copies, while supplies last, from the Public Information Center, EPA, Washington, D.C. 20460.

EPA's Position on the Energy Crisis — Discusses the need for conserving energy and methods for doing so, including some apparent conflicts between healthy economic growth and environmental protection. 18 pages.

Pesticide Safety Tips — A guide for householders. Pocket-sized card.

Why Unleaded Gas? — Some 1975 car models will have catalytic converters and require unleaded gas. This 4-page leaflet explains why. Available from most gas stations as well as from EPA.

Career Choices — A 16-page booklet about environmental careers, with colleges offering environmental courses, federal agencies involved in environmental management, and other sources of career information.

Pesticide Registration — How it protects you, your family, and the environment. 12 pages.

MY THREE MEN FERTILIZED 700 TREES IN A DAY AND A HALF...

"My three men fertilized 700 trees in a day and a half with Jobe's Tree Food Spikes. I couldn't believe it . . . so I went around and checked behind them. Sure enough, they'd fertilized all 700 trees. Beautiful," says Richard Boehm, Superintendent, Military Golf Course, Wright-Patterson Air Force Base, Dayton, Ohio.

"I want to keep my trees growing strong and beautiful. That's why I used Jobe's Tree Food Spikes. I just couldn't believe that Jobes could save so much time but we did the entire course in a day and a half," concludes Dick Boehm.

"And you can see the difference they make. Similar trees were put in on the other side of the road. Ours are greener." confirms Boehm.

Jobe's Spikes can save just as much time for you. Each spike is a premeasured amount of the right combination of plant foods for trees and shrubs. This eliminates the chance for mistakes, while saving time and money. And they've proven effective in University tests.

Order direct or from your jobber-distributor. $30 per case (105 spikes) for 5 cases; $25 per case for 15 cases. Shipped pre-paid.

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Mel Rich says: "In mile-high Denver we need a grass that can withstand cutting shock, survive long hauls and stay green through the laying installation." He picked

baron KENTUCKY BLUEGRASS

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Mel Rich, president of Richlawn Turf Farms and pioneer grower of 2,000 acres of sod in Denver talks about Baron Kentucky Bluegrass.

"In our climate of cool nights, warm days, high winds and low humidity, we need a grass that can survive long hauls and stay green, fresh and beautiful."

"We've been growing Baron both in our mixtures and pure stands. We're impressed with Baron's rapid establishment, rugged durability and beautiful final appearance on custom lawns. And Baron holds its color—even with neglect."

"Baron's strong, vigorous root structure withstands cutting shock better and survives through long hauls and laying installations. Baron gives us a sod with a dense turf and root structure like a finely woven carpet."

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